ATTACHMENT 21
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RS-8410-01C

Versar INC.

ENVIRONMENTAL RISK ASSESSMENT SURVEY:
BRIGHTON LANDFILL
BRIGHTON, ILLINOIS

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VERSAR INC.

ENVIRONMENTAL RISK ASSESSMENT SURVEY:
BRIGHTON LANDFILL
BRIGHTON, ILLINOIS

Prepared for:

Brighton Landfill
1201 Dunn Road
St. Louis, Missouri 63138

Prepared by:

Versar Inc.
6850 Versar Center
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Job No. 916.4

March 21, 1985

FOREWORD

This report was prepared by Versar Inc. of Springfield, Virginia, for Brighton Landfill, St. Louis, Missouri, under a contract dated November 30, 1984. Mr. Robert Peters, environmental specialist, conducted the site survey and prepared this report. Mr. Bruno Maestri, the Project Manager, assisted in report preparation, and with Mrs. Gayaneh Contos, Manager of Versar's Risk Decision Analysis Group, reviewed this report and approved its release.

Much of the site specific data regarding geology and hydrogeology is taken from various reports prepared by M. Rapps Associates, Inc.; their work is hereby acknowledged.

Bruno Maestri
Project Manager

DISCLAIMER

The purpose of this risk assessment survey of operations is only for underwriting purposes and to assist in related loss control activities. Versar, Inc. does not assume responsibility for the discovery and elimination of hazards which could possibly cause accidents, injuries, or damage. Compliance with submitted recommendations and/or suggestions in no way assures elimination of hazards or the fulfillment of a risk's obligation under any local, state, or federal laws or any modifications or changes thereto. In many cases, federal, state, or local codes require the prompt reporting to relevant authorities if a release occurs. It is the responsibility of the risk to notify authorities of any conditions which are in violation of the current legal standards.

Factual information regarding operations, conditions, and test data were obtained, in part, from the risk and has been assumed by Versar to be correct and complete. Since the facts stated in this report are subject to professional interpretation, they could result in differing conclusions. In addition, the findings and conclusions contained in this report are based on various quantitative and qualitative factors as they existed on or near the date of the survey. Therefore, if the recommendations made in this report are not implemented within a reasonable period of time, there can be no assurances that intervening factors will not arise which will affect the conclusions reached herein.

Compliance with any recommendations and/or suggestions contained in this report or made during the survey does not implicitly or explicitly indicate that insurance coverage will be secured. Versar makes no warranty and assumes no liability with respect to the use of information contained in this report.

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1.0 SUMMARY OF ASSESSMENT

1.1 Introduction

On December 18 and 19, 1984, Versar conducted an environmental risk assessment survey at the Brighton Landfill in Brighton, Illinois. The purpose of the assessment was to determine the actual or potential liabilities or conditions which might affect the suitability of this site to be insured against environmental impairment from non-sudden causes. Versar was requested to perform this survey by Gene Evans, President of Com-Pak Engineering (owner/operator of facilities); as such, the information and site data included in this report should be used only for the purposes of evaluating potential risk, and not for compliance or other evaluations. Com-Pak Engineering owns and operates a hazardous waste land disposal operation.

The survey consisted of (1) the acquisition of operational and related site data; (2) a site inspection; (3) interviews with facility personnel; and (4) contact with pertinent regulatory agencies.

1.2 Basis of Risk Assessment

A qualitative judgment on the potential liabilities associated with this site has been prepared based on the following criteria:

- The inherent risk of the substances handled or produced at the site.
- The degree of control exercised in materials processing, handling, and storage.
- The existing environmental contamination at the site.
- The adequacy of current practices for the treatment of waste streams released to the environment.
- The adequacy of corrective measures taken to alleviate any past problems.
- The current facility environmental management program.
- The location of potential target or receptor populations.

The qualitative scale used for ranking sites ranges from low (below average) to high (above average) probability for environmental impairment liability.

1.3 Background

The Brighton Landfill is located on a 43-acre site 8 miles north of Alton, Illinois. The site is owned and operated by Com-Pak Engineering Inc. It has been in use since 1971 as a disposal facility for municipal, commercial, industry, hazardous and special waste (as defined by Illinois law). The site was operated from 1971 to 1975 without a permit by Todd Sanitation Inc. and in 1975 received IEPA permit No. 1975-54. The facility was sold to the present owner in 1979 and is actually two facilities for permitting purposes. Hazardous waste have been placed in both sites with Site II being the current "active" area. Waste is now landfilled in 18-feet deep, 3.5-feet wide trenches. Ninety-one percent of the hazardous waste material received at the site since November 19, 1980, is from Olin Corp. in Wood River, Illinois (see Appendix D). No free liquids are accepted at the facility.

The site has been the object of recent (1984) state/Federal regulatory action. In April 1984, the owner/operator was sited for 26 violations of state/federal IEPA and RCRA regulations. On a reinspection in May, 1984, 17 of these violations were found to remain. The central theme of these violations is the apparent lack of an acceptable groundwater monitoring program. The results of a December 11, 1984 site inspection by Illinois EPA are not available at this time. The Part B application for this site (submitted in 1984) has had two "notice of deficiency" letters. Again, the lack of an adequate sampling/monitoring program has been the major issue. This is a key issue because statistically significant differences in levels of contaminants have been found in some wells (pH, TOX).

1.4 Risk Assessment Rating

As a class of facilities, the land disposal of hazardous wastes carries higher than average risk. Given the current set of uncertainties concerning the exact extent and source of the groundwater contamination presently at the site and given that the site has only naturally occurring containment (i.e., no leachate collection system or membrane lining), we conclude that the probability of environmental impairment liability resulting from the hazardous waste land disposal facility operated by Com-Pak at Brighton, Illinois, is medium to high (above average) when compared to similar facilities. The reasons for this rating are as follows:

Negative Factors

- The facility does not have artificial barriers and underdrains to intercept and collect leachate. Therefore, environmental emissions are more likely at this landfill then at one which meets standards for new land disposal facilities under RCRA. It should be pointed out that the current excavation to 60 ft. will contain a leachate collection system and bottom side walls, lined with recompacted clay with permeability less than 1×10^{-8} cm/sec. The site operator has expressed his intention to deposit the waste from the one trench in Site I and all waste in Site II into trenches of this type construction.

- Given the unusual geophysical conditions at the site, the determination of potential releases of pollutants from the site is complex. The previous or potential contributions of the facility to the degradation of the groundwater is difficult to separate from the contribution of the natural environment. This is because the groundwater monitoring program as mandated by RCRA will not generate data which is conclusive in this regard. Brighton Landfill has prepared and is currently implementing a groundwater assessment program which addresses parameters that are both indicators of landfill-related contamination and which are also contributed by any off-site source in only very small concentrations. Being an agricultural area, ammonia and nitrates could be coming from fertilizer and past pesticide applications which could interfere with the TOC and TOX readings. The potential contribution of the coal particles is also a factor. All items considered, "chlorides" seems to hold the greatest promise as a true indicator of landfill contributed contamination. This parameter is included in Brighton Landfill's groundwater quality assessment program.

- The current disposal technique (trenching) is occurring at an elevation above that allowed by the facilities permit. This aggrevates the problem of containing the surface run-off. It should be noted that this problem is temporary, while Site II is used as a kind of storage area awaiting final disposal in the excavation at the southwest corner.

- Two legal actions are pending against the facility. A "3008" compliance letter under RCRA and a suit brought by the state attorney general's office claiming that the facility presents a common-law nuisance. Concerning the notice of deficiency letters, the facility owner/operator has made, and is continuing to make, reasonable efforts to resolve what USEPA perceives to be problems with Brighton Landfill's monitoring program. Other items outlined in the deficiency letters are currently being corrected after consultation with the state.

Favorable Factors:

- The facility is located in a non-urban agricultural area.

- Only one adjacent landowner is using groundwater as a drinking water source. The landowner is upgradient and can connect to a public water supply.

- The hazardous waste (received since November 19, 1980) currently in place at Sites I and II, is proposed to be moved at some later date to a proposed disposal area in the southwest corner of Site II. If this excavation/trench is constructed so as to meet the disposal performance standards outlined by IEPA in the development permit, then the potential risk from non-sudden releases will be reduced.

- Only 20 percent (by volume) of the waste in place at the facility is classified as hazardous. Hazardous and non-hazardous waste is not now, nor was it in the past, segregated. The entire facility (Sites I and II) must therefore be considered a hazardous waste disposal facility. Mixing hazardous sludges with non-hazardous municipal waste is a kind of "treatment" technique, but in the long run will take up valuable space in the landfill. The facility would be well advised to consider a more formalized approach to fixation or stabilization.

1.5 Recommendations

A listing of our recommendations is given in Section 6.2 of this report.

2.0 SURVEY BACKGROUND

2.1 Location

The Brighton landfill is located on a 43 acre site, 8 miles north of Alton, Illinois. The two sites are in the south half of Section 30, Township 7, Range 9 West, Macoupin County, Illinois. The regional setting is depicted in Figure 1.

2.2 Facility History

The land disposal of solid waste material at the Brighton landfill was begun in January 1971 by Todd B. McKee on the parcel referred to as Site I. In 1978 the original owner expanded to a 11.36 acre parcel leased from Louis Schlief. In 1979 Gene Evans bought Todd Sanitation Service and now owns and operated the Brighton Landfill as a division of Com-Pak Engineering, a company owned by Mr. Evans. Com-Pak Engineering now owns all the parcels on which hazardous or special waste has been placed.

2.3 Climatic Data

Average January temperature is 33 degrees and the average July temperature is 78 degrees with an average rainfall of 20 to 40 inches.

2.4 Population Distribution

The population distribution is shown in Figure 2. The area around the landfill is non-urban agricultural farmland.

2.5 Geology and Groundwater

The physical setting the landfill is one where the land surface elevations vary from 600 to 630 feet above sea level. The Site I is located on an eastward sloping hillside above a small southward flowing stream. Regional data suggests the unconsolidated glacial drift varies from 20 to 50 feet thick. The exposed west wall of the excavation on Site II bears this out. The glacial drift is composed mainly of silts

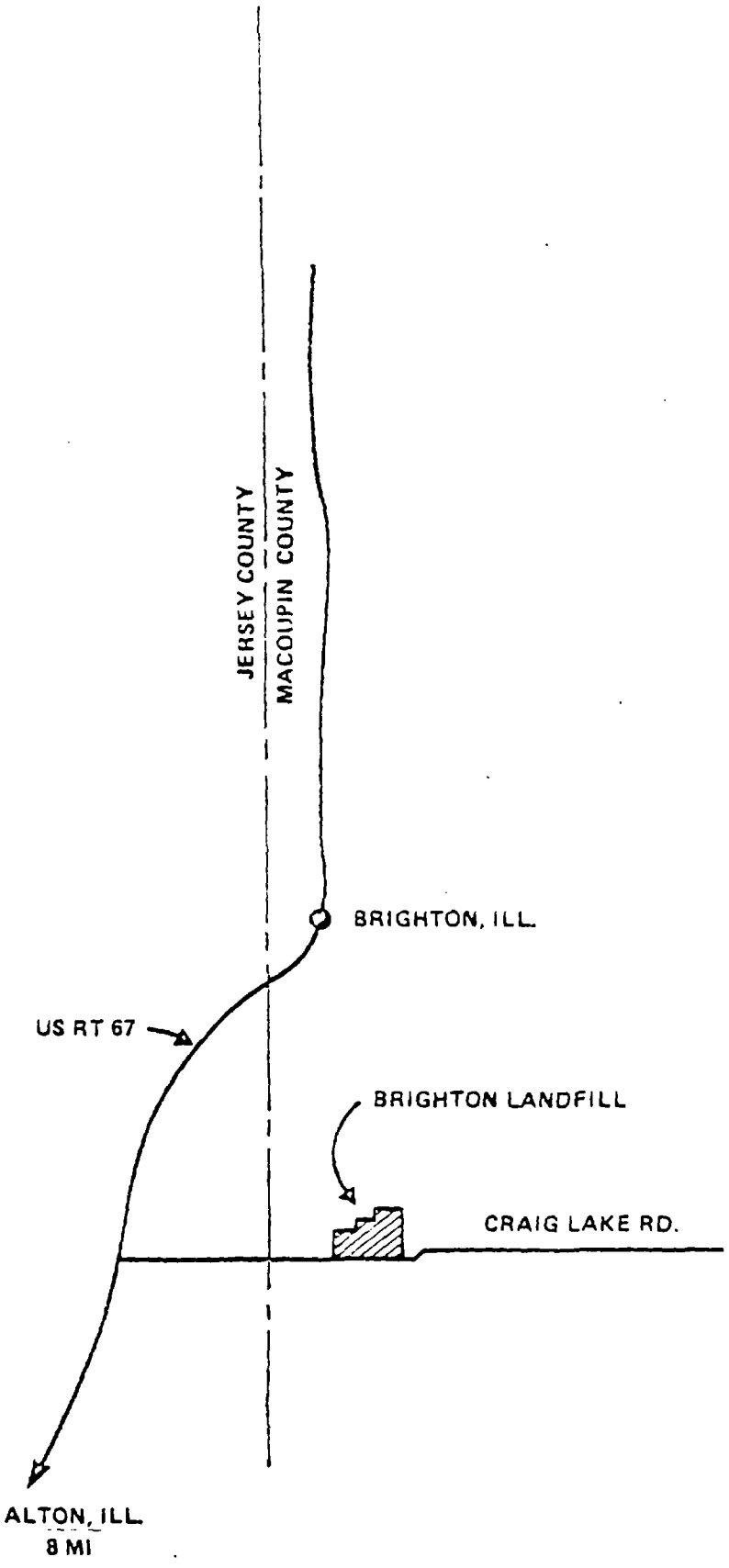


FIGURE 1 BRIGHTON LANDFILL LOCATION MAP

FIGURE 2 BRIGHTON LANDFILL - POPULATION DISTRIBUTION

THE PLOT CENTER IS AT:
LATITUDE 39.0:78
LONGITUDE 90.1456

RADII		POPULATION	
From	To	Within Ring	Cumulative
0.00	0.50	0	0
0.50	1.00	0	0
1.00	2.00	957	957
2.00	5.00	3123	4080
5.00	10.00	11271	15351
10.00	20.00	102511	117862

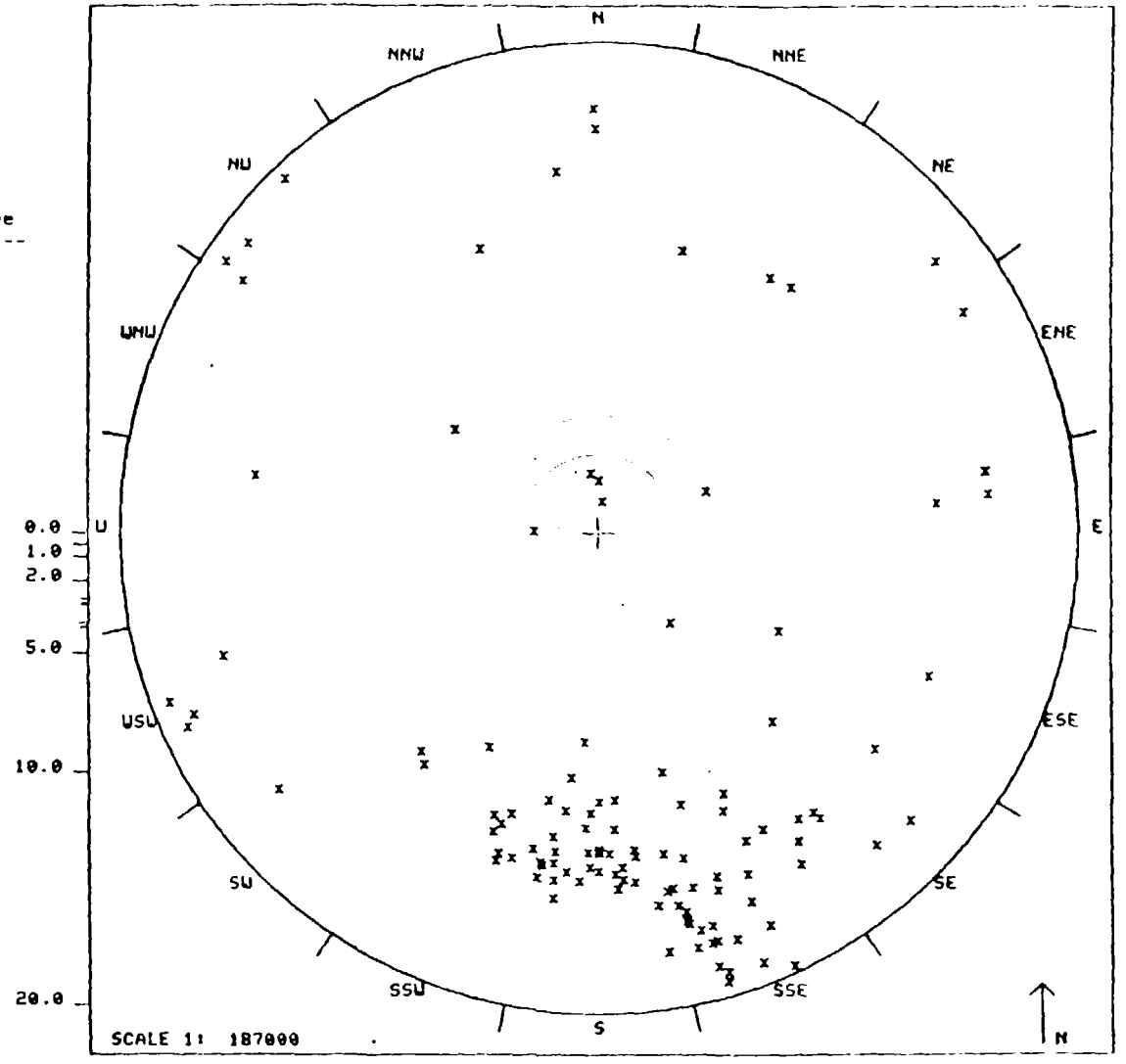
QUADRANT TOTALS:

Sector	Population
N	2037
NNE	1657
NE	1203
ENE	2095
E	3114
ESE	1881
SE	7325
SSE	33204
S	26007
SSW	18339
SW	8631
WSW	2570
W	2867
WNW	0
NW	6430
NNW	502

x

(CR) to continue!

BG/ED centroid distribution around BRGHTN LANDFILL



over compact Illinoian-age glacial till. Small supplies of groundwater are available locally from thin permeable zones in the glacial drift.

Brighton Landfill is located in an upland area in the extreme Southwestern corner of Macoupin County, Illinois. This area is characterized by its steep ridges and valleys and considerable topographic relief. Much of the area is wooded. Subject site is situated on a plateau of sorts. The site is flanked on three sides by a series of streams which drain the uplands.

The entire state of Illinois has been mapped (generally) by the Illinois State Geological Survey (ISGS) in terms of relative suitability for the shallow burial of Municipal Solid Waste (the predominant receipts of Brighton Landfill). Figure 3 is an excerpt from that effort which deals only with Macoupin County. Brighton Landfill is identified on that map as being in an area of "G" classification. This is the best classification given by ISGS in terms of defining the lowest risk to groundwater.

The Brighton Landfill site is situated in the Springfield Plain Physiographic division of the Central Lowland Province of Illinois. Because significant topographic variations exist and because these are the result of significant differences in past erosion, one might expect significant differences in the thickness and stratigraphic sequence of deposits on site.

Published information by the Illinois State Geologic Survey (ISGS) suggests that the stratigraphic sequence of deposits which should be expected at higher elevation areas on site includes in descending order of depth Peoria Loess; Roxana Silt; the Hagerstown, Vandalia Till, and Smithboro Till members of the Glasford formation; and undifferentiated till members of the Banner Formation. These formations were deposited during the Wisconsin, Illinoisan, and Kansan periods of Pleistocene Glaciation and possibly during the Farmdale, Sangamon, and Yarmouthian interglacial periods.

MACOUPIN COUNTY

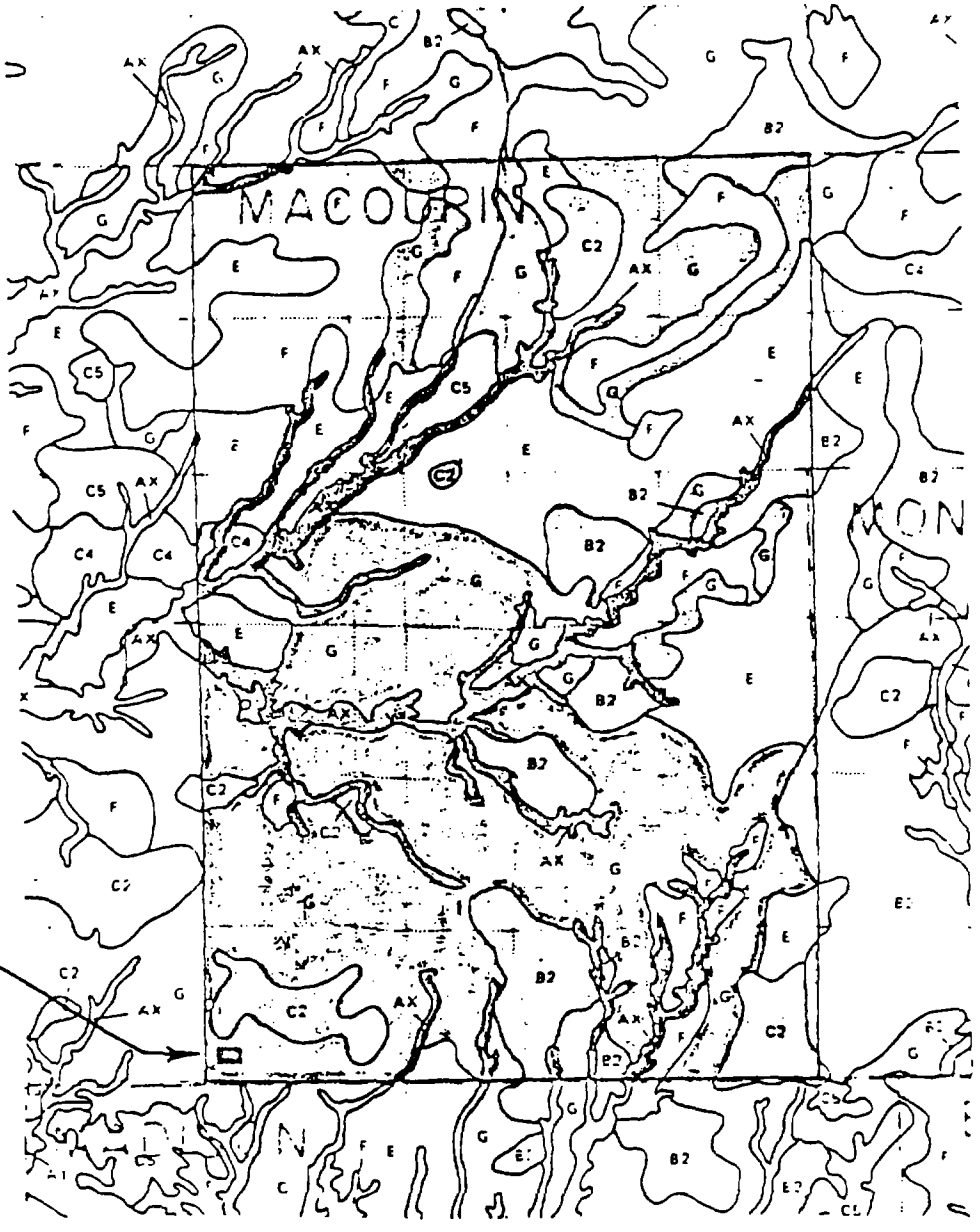


FIGURE 3 DESCRIPTION OF GEOLOGIC MATERIAL

The bedrock deposits underlying the Brighton site belong to the Pennsylvania System and are transitional between the Modesto and Carbondale formations. The Modesto and Carbondale formations are predominantly shale with lesser of limestone and sandstone and with some coal in the Carbondale.

The texture of the deposits sampled at the site is predominantly cohesive with a relatively small number of significant sand seams. Although the deposits are predominantly cohesive, their texture varies significantly with location and depth, ranging from plastic clays with little sand and gravel through silty clays, silt loams, clay loams, loams, and sandy loam materials and even including shaley clays, lignite, and peaty materials. As indicated by the borings, the soil overburden at the site is somewhat thicker than might have been expected from available geologic information. This appears to be primarily due to the existence of a bedrock valley beneath the site. This valley appears to be a northward and westward extension of the bedrock valley for the West Fork of the Wood River.

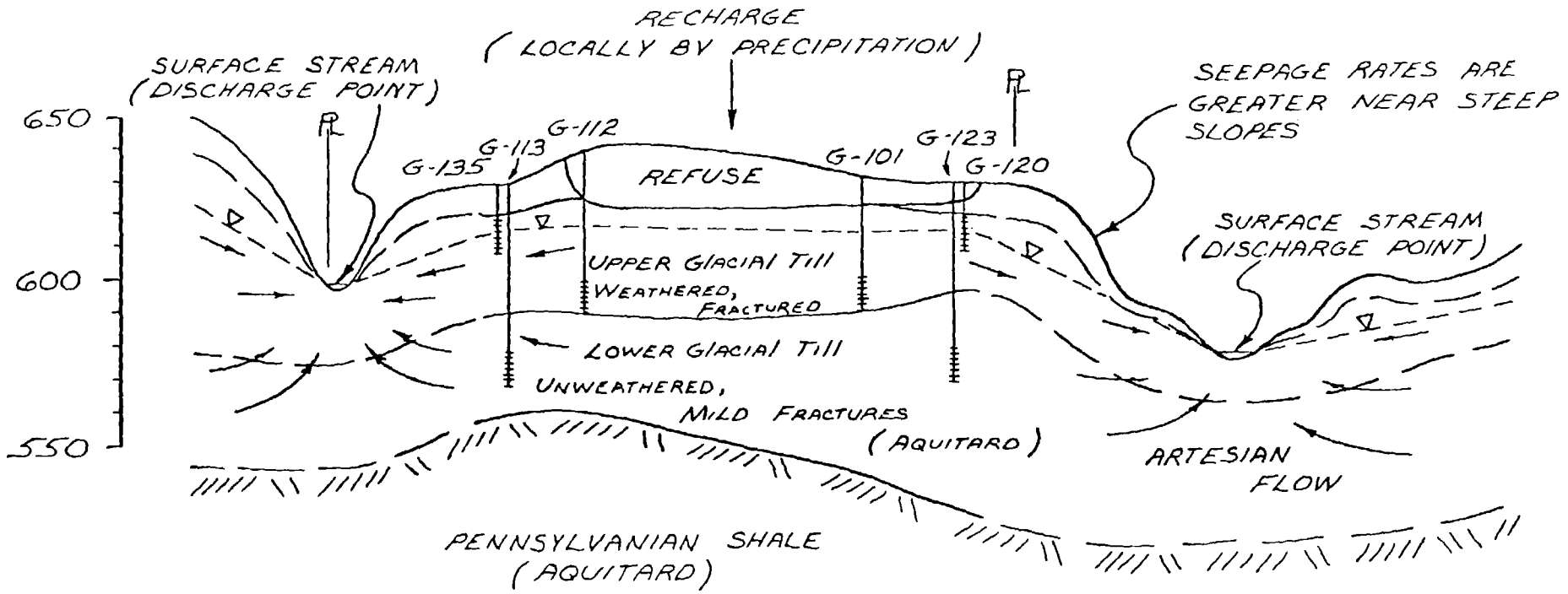
A total of 37 falling head permeability tests have been performed on samples at the site; 30 of these were performed on samples obtained during the latest program of investigation. These tests indicate permeabilities consistently in the 10^{-8} cm/sec range for the cohesive till and permeabilities in the 10^{-6} cm/sec to 10^{-7} cm/sec range for the occasional loamy sands encountered. Site hydrogeology is depicted in Figure 4.

Groundwater

Past and present site investigations indicate that there is no significant usable groundwater aquifer in the vicinity of the site either within the the glacial drift materials or within the upper 200 feet of the underlying bedrock deposits. There are only shallow wells in the area which obtain small quantities of water from sand seams in the glacial drift. There is only one known well which is used for water supply presently within the near vicinity of the site.

SITE HYDROGEOLOGY

PLATE 3.



UNIT	MEAN TRANSMISSIBILITY T (gpd/ft)	MEAN LAB PERMEABILITY K (cm/Sec)	MEAN FIELD PERMEABILITY K (cm/Sec.)	MEAN HORIZONTAL SEEPAGE RATE (ft/yr)
UPPER TILL	15.35	8.46×10^{-8}	1.69×10^{-4}	25.44
LOWER TILL	0.585	1.01×10^{-8}	1.09×10^{-6}	0.24

FIGURE 4 SITE HYDROGEOLOGY

Examination of groundwater data from the past investigation on the 11.36-acre Second Leased Area and water levels and depths of encounter observed during previous study suggests that there are at least two separate groundwater surfaces within the soil deposits on site. The uppermost piezometric surface appears to be within the Hagerstown and uppermost weathered sandy portion of the Vandalia Till members and is the result of entrapment of infiltrated rain water on top of the very dense Vandalia clay. In a recent survey of shallow groundwater conducted by IEPA for a survey impoundment assessment it was found that the Brighton Landfill is at least 10 miles from any of the aquifers identified by IEPA at that time (Figure 5).

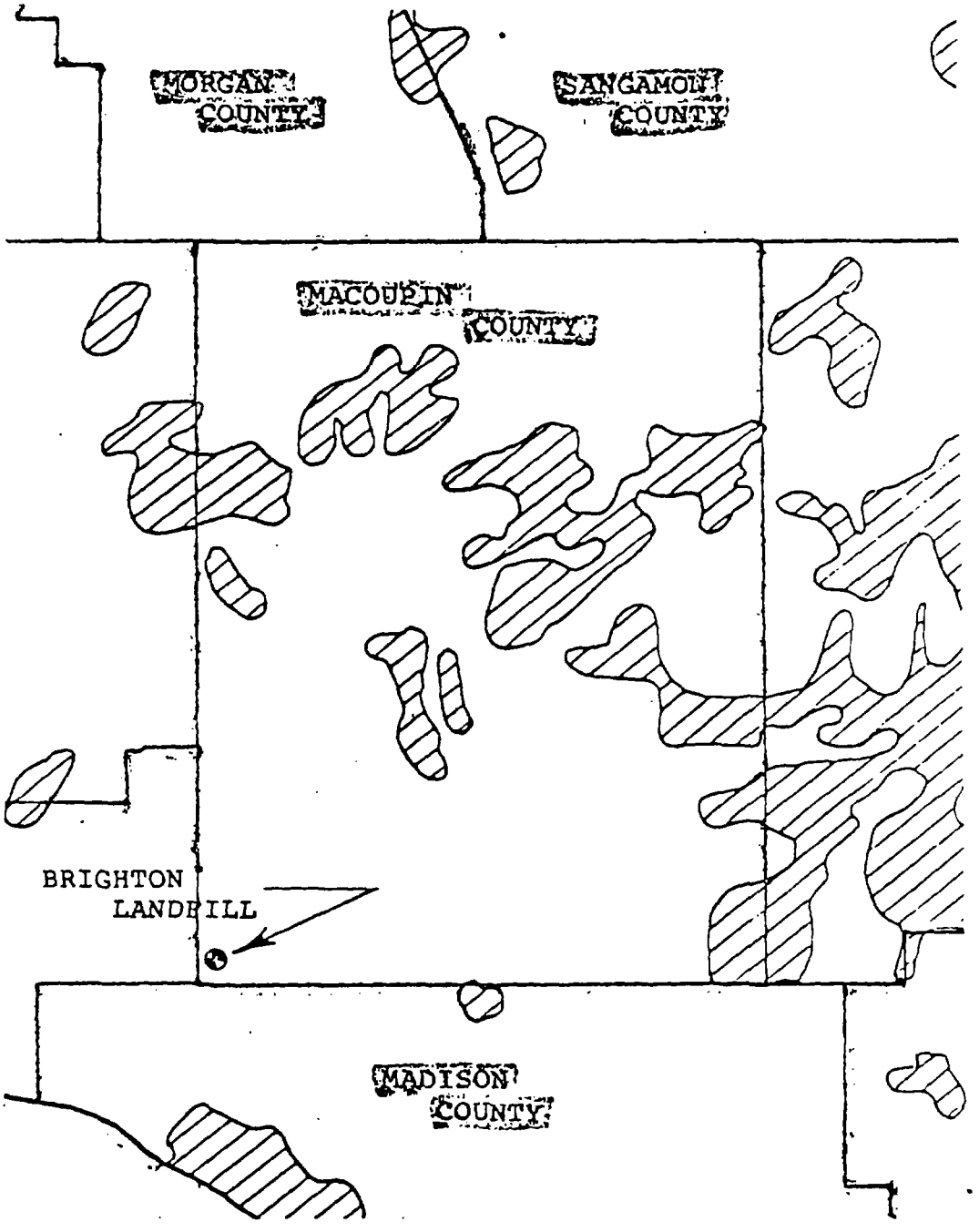
A report by M. Rapps concludes that, the potential impact of Brighton Landfill is limited to a portion of the local drainage basin(s) that is not much greater in size than the landfill itself. There are no known potable water wells in use in this area nor are there likely to be any because city water is available. The expense of installing a large diameter dug well exceeds that of tapping on to the city water line. Moreover, water contained throughout much of the lower till is of such poor quality that it is unsuitable for use as drinking water, either by humans or livestock. This water has been shown to contain sulfate concentrations in excess of 1000 mg/l which apparently are not the result of landfill activity.

Even though there is some controversy over whether the upper till at this site constitutes an aquifer, the Brighton Landfill is going to monitor the upper till in an extensive fashion that dovetails in all respects with the requirements of Subpart F.

Groundwater flow at the site and in surrounding areas generally corresponds to surface topography. Consequently, flow is multi directional. This can be seen on the site map and is further illustrated in the potentiometric surface map (Figure 6).

FIGURE 5 SHALLOW AQUIFERS IN ILLINOIS

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY - 1979



From: "INVENTORY AND ASSESSMENT OF SURFACE IMPOUNDMENTS IN ILLINOIS", IEPA,JAN.,1980, - Dr. Rauf Piskin, et. al.

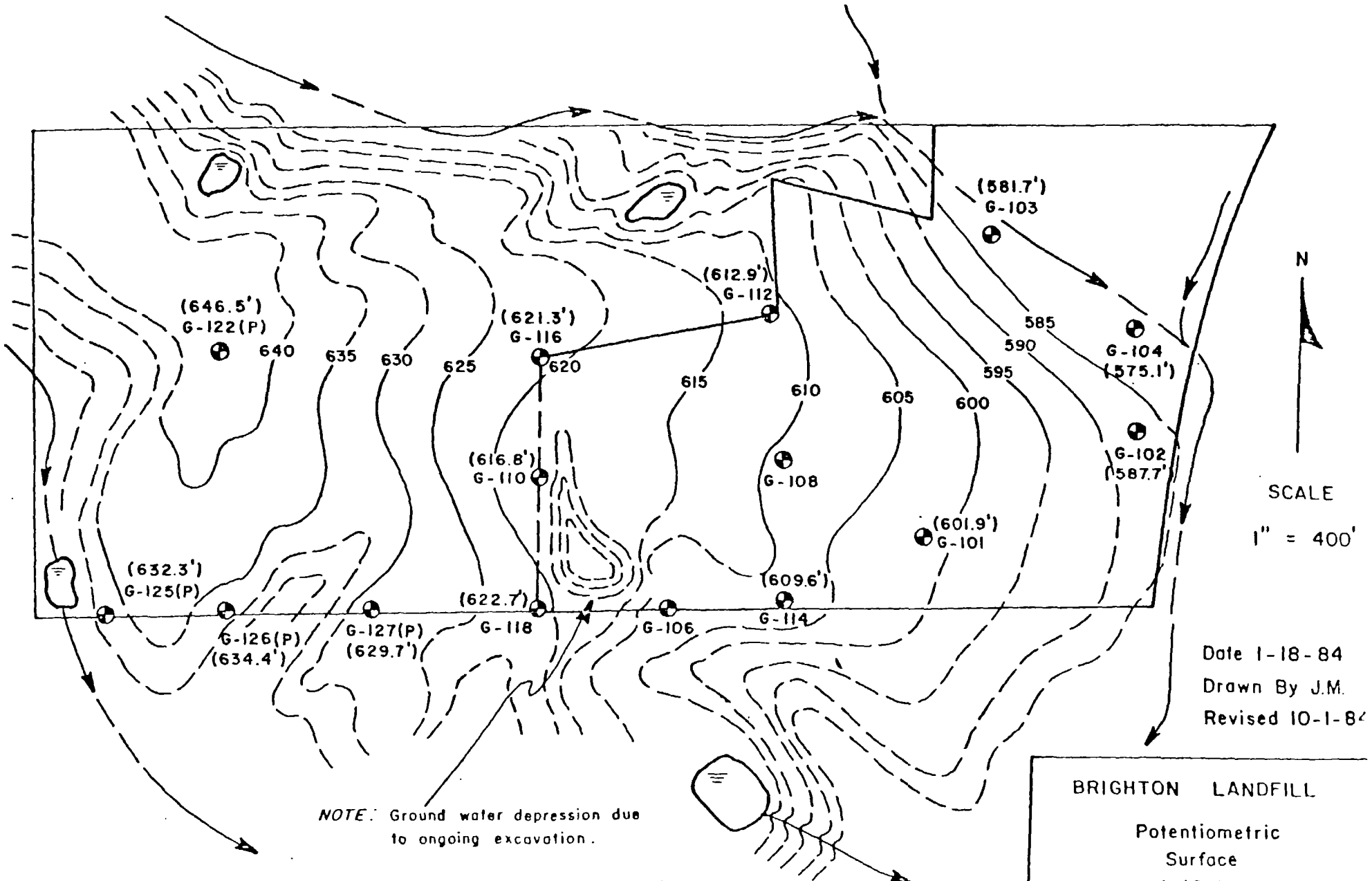


FIGURE 6 POTENTIOMETRIC SURFACE

2.6 Surface Water

Based on our site visit and a report by M. Rapps Associates, Inc., subject site is situated on high ground in an area of substantial topographic relief, much of which is characterized by steep timbered ridges and valleys. Uplands in the vicinity and at subject site are well drained but have milder slopes than surrounding timber lands. The uplands are generally pasture but are also planted in row crop in areas of milder slopes. Intermittent streams in the valley are local (unnamed) tributaries to the Wood River. They carry surface runoff and discharging groundwater seepage (base flow) from the uplands.

Figure 7 identifies the pertinent drainage area. It includes those portions of Brighton Landfill that have been landfilled or that are planned for future landfilling and those areas adjacent to the site which are part of the overall drainage area that receives contributions from landfill property. The area bounded by stream segments identified as 1, 2 and 3 represents the geographical limit of potential discharge by seepage and storm water from the landfill. This area is actually a combination of portions of several small watersheds. The approximate lengths of stream segments 1, 2 and 3 are 5300', 2300', and 1800', respectively.

The approximate percentage breakdown of land use within the three areas identified in Figure 1 is as follows:

Drainage Area	Row Crop % (Acres)	Pasture % (Acres)	Timber % (Acres)	Landfill % (Acres)
I	-	41.1 (23.7)	37.2 (21.4)	21.7 (12.5)
II	42.4 (20.7)	17.9 (8.8)	39.7 (19.4)	-
III	-	10.3 (2.3)	28.7 (6.3)	61.0 (13.5)

Ground cover in the above areas includes wheat (row crop), native grasses (pasture and portions of landfill), and a broad mixture of trees, including many mature hardwoods, in the timber land. Portions of the landfill area have no vegetative cover.

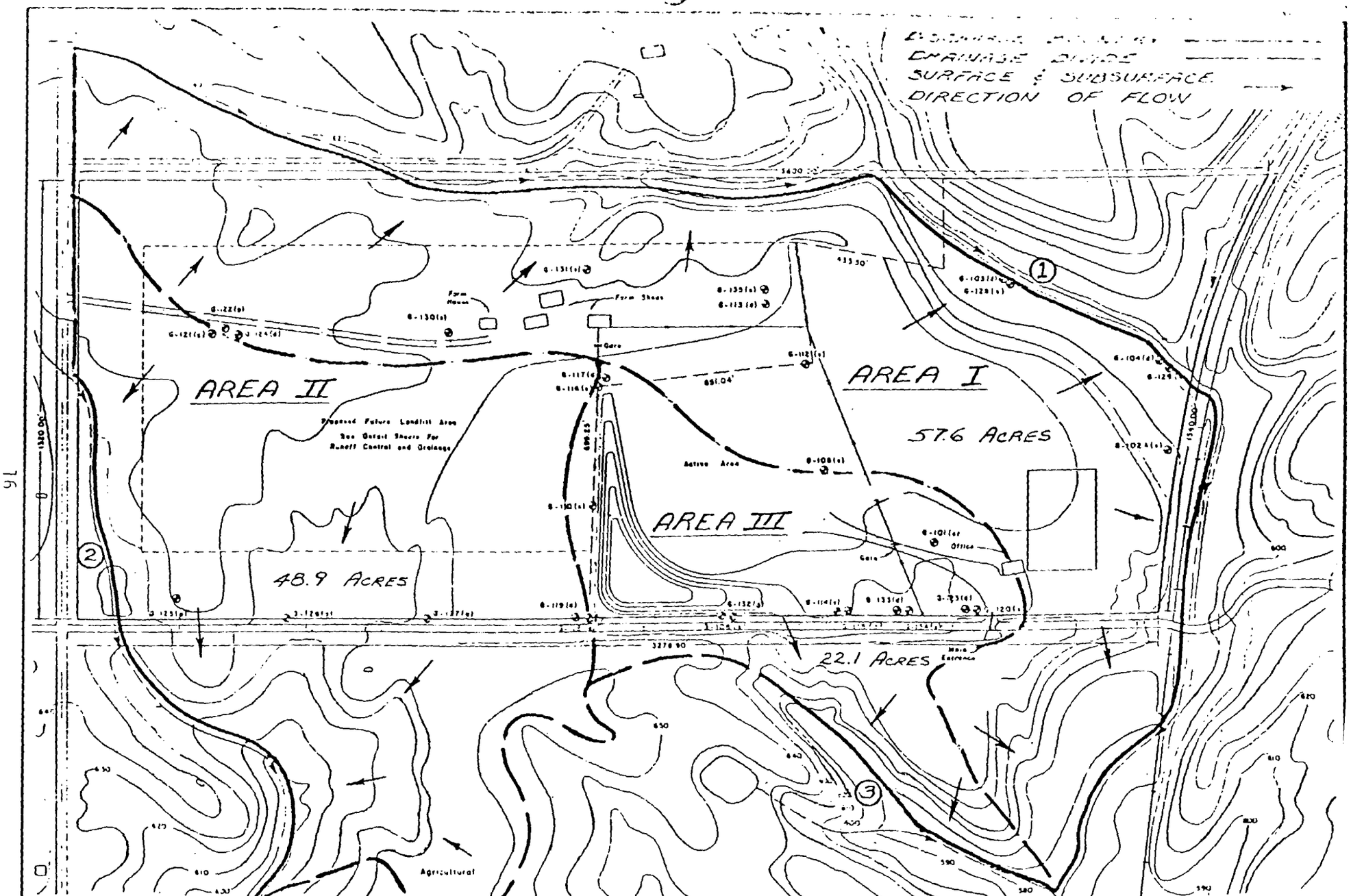


FIGURE 7 DRAINAGE AREAS

M. RAPPS ASSOCIATES, INC.

Taken as a mass unit, and using factors discussed herein, the 128.6 acre Brighton Landfill drainage area should follow an annual water budget on the order of:

		In/Yr	Gal/day
Precipitation	-	38	363,500
70% Evapotranspiration	-	26.6	254,450
30% Stream discharge	-	11.4	109,050
60% Runoff	-	6.84	65,430
40% Base flow	-	4.56	43,620

Using these figures the normal year contribution to stream flow from the landfill drainage area is approximately 0.168 cfs, roughly 0.067 cfs of which is contributed by seepage. On this basis, average annual storm water and seepage contributions to the three stream segments are:

Stream Segment	Total Flow	Runoff	Base Flow
1	0.075 cfs	0.045 cfs	0.03 cfs
2	0.064 cfs	0.038 cfs	0.026 cfs
3	0.029 cfs	0.017 cfs	0.012 cfs

Using ten inches as the nominal local contribution to stream flow, the three stream segments (1, 2, 3) should carry average annual flows of from 0.2115 to 0.9648 cfs, 0.0919 cfs, and 0.0415 cfs, respectively. Dilution factors (total flow/base flow) at the downstream limits are then approximately 32.2, 3.5, and 3.5, respectively. At the downstream point where the streams converge, average annual flow is 2.21 cfs for an overall dilution ration of 32.5. A map showing the numerous streams that contribute flow to the system, and their respective contributions, is shown on Figure 8. A companion map (Figure 9) shows the same area with cumulative flows. Actual surface water quality is contained in Appendix B.

Watershed	Area (Acres)	Mean Annual Flow (CFS)
1	136.2	0.1568
2	39.2	0.0451
3	135.8	0.1563
4	84.7	0.0975
5	89.3	0.1028
6	20.2	0.0233
7	63.7	0.0733
8	165.3	0.1903
9	183.7	0.2115
10	149.0	0.1715
11	225.5	0.2596
12	79.8	0.0919
13	36.9	0.0425
14	54.9	0.0632
15	27.9	0.0321
16	49.8	0.0573
17	40.2	0.0463
18	52.2	0.0601
19	19.3	0.0222
20	34.9	0.0402
21	60.3	0.0694
22	22.7	0.0261
23	148.1	0.1705
	1919.6	2.2097

WATERSHED CONTRIBUTIONS

TO

MEAN ANNUAL STREAM FLOW

FIGURE 8 WATERSHED CONTRIBUTIONS

MEAN ANNUAL STREAM FLOW (CFS)

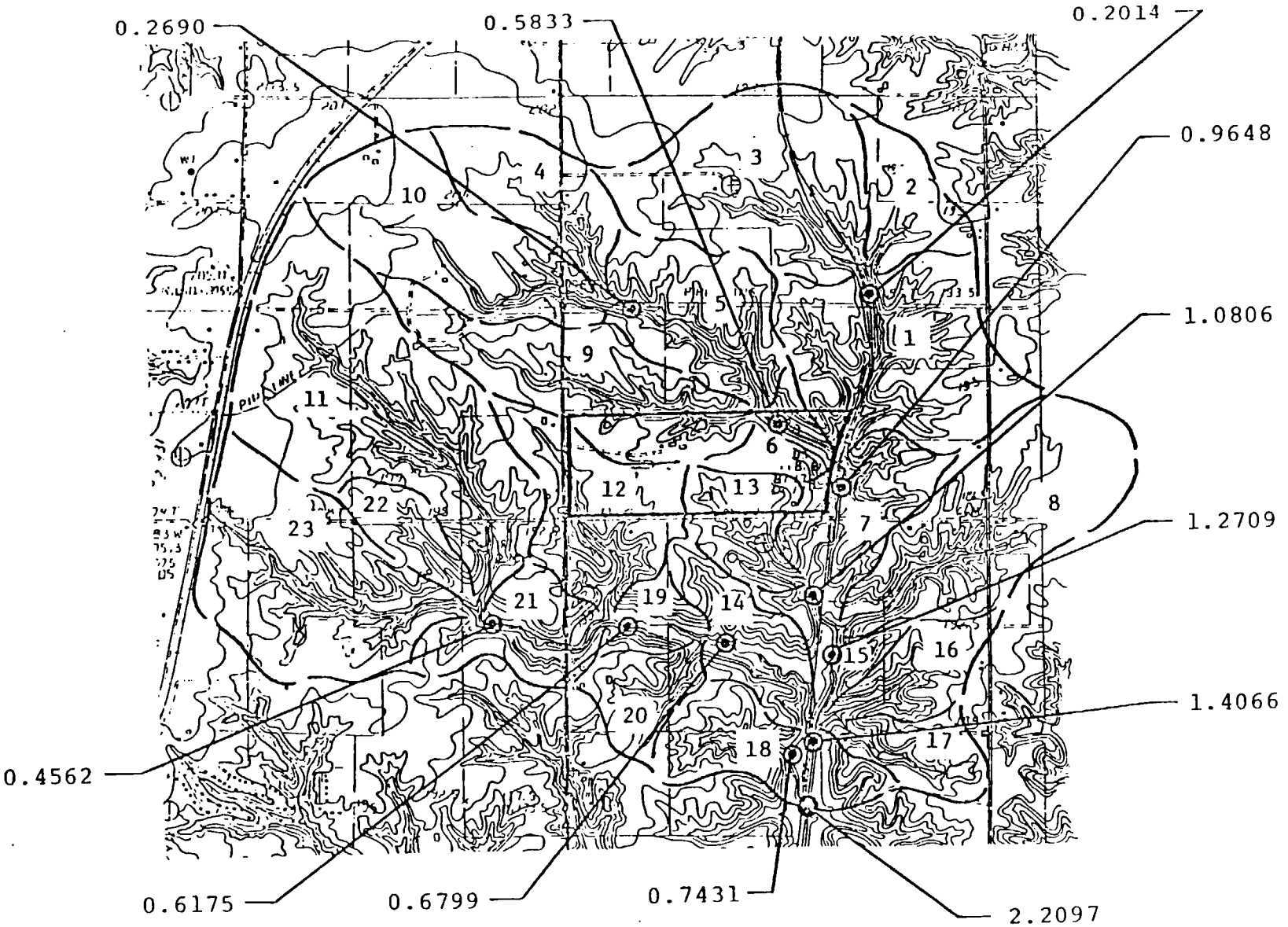


FIGURE 9 ANNUAL STREAM FLOW

3.0 LANDFILL OPERATIONS

3.1 General Information

As previously mentioned the applicant has two sites. Site I, 32.11 acres and Site II 11.36 acres. Unless a specific site is mentioned in the text, comments and conclusions refer to the entire facility.

3.2 Past Operations

Site I opened in January, 1971, roughly two and one half years prior to the effective data of the Chapter 7 Solid Waste Rules and Regulations. At that time Illinois landfills were subject to the Department of Public Health's (IDPH) 1966 regulations and could legally operate with either a valid IDPH Registration or with a permit issued either by IDPH or the then newly formed IEPA. The IDPH regulations were finally superceded by Chapter 7 in July, 1973. Throughout this period, and for quite some time thereafter, the Todd Landfill operated with neither permit nor registration.

The site was eventually permitted in November, 1975. However, this came nearly five years after the operation began. During that interval the site apparently operated on an ad hoc basis with little in the way of organized planning. The result is that refuse exists throughout the original parcel at depths varying from a few feet to as much as thirty feet.

The greatest depth of fill (in the original Todd parcel) is in areas that previously eroded "gulleys". Those areas flank the unnamed intermittent creek and corresponding lowland.

Refuse is estimated to be as deep as thirty feet in these former gulleys. On the other hand refuse deposits become increasingly thin in the uplands where in a portion of which the combination of refuse and cover material is estimated to average on the order of five to seven feet. These estimates are based on a number of factors which include

physical observations, soil borings, recent excavations into previously filled areas, discussions with the previous operator and finally a comparison of topographic maps prepared in 1975 and 1978 with current estimated topography.

When first opened the site was operated as an "Area" fill. Plans corresponding to the site's initial permit retained this technique likely so as to maintain continuity. However, in 1978 the original operator applied for a developmental permit to expand the site with an 11.36 acre addition. The expansion plans provided for shallow excavation to a maximum depth of approximately twenty-five feet.

The expansion permit was issued June 29, 1979, some ten months following submission of the application. On the original Todd Sanitation Service site (Site I) there was obviously a drum storage area 100 ft x 75 feet but there are no drums on the surface of the landfill today. The Todd Sanitation Service portion of the site is shown in Figure 10. The drummed storage area is shown in a drawing from an amendment Part A dated March 1982 (Figure 11). Site I received a development permit on July 31, 1975, and an operating permit on November 12, 1975. Then as now, the majority (90%) of the waste disposed at the facility is non-hazardous special waste and municipal waste.

3.3 Present and Future Operations

Site II was originally leased from another owner by Brighton Landfill Inc., a division of Com-Pak Engineering. On Site II the operator has been granted a supplemental permit by IEPA on January 12, 1982 which allows the deepening of the disposal trenches from 30 to 60 feet to obtain maximum volume disposal of waste. Prior to the issuance of an operating permit for each phase on Site II, three objectives are to be met. These objectives concern the permeability of the base and side walls of each phase, the permeability of the sealed sidewalls, and that a leachate collection system has been completed according to plan. To date

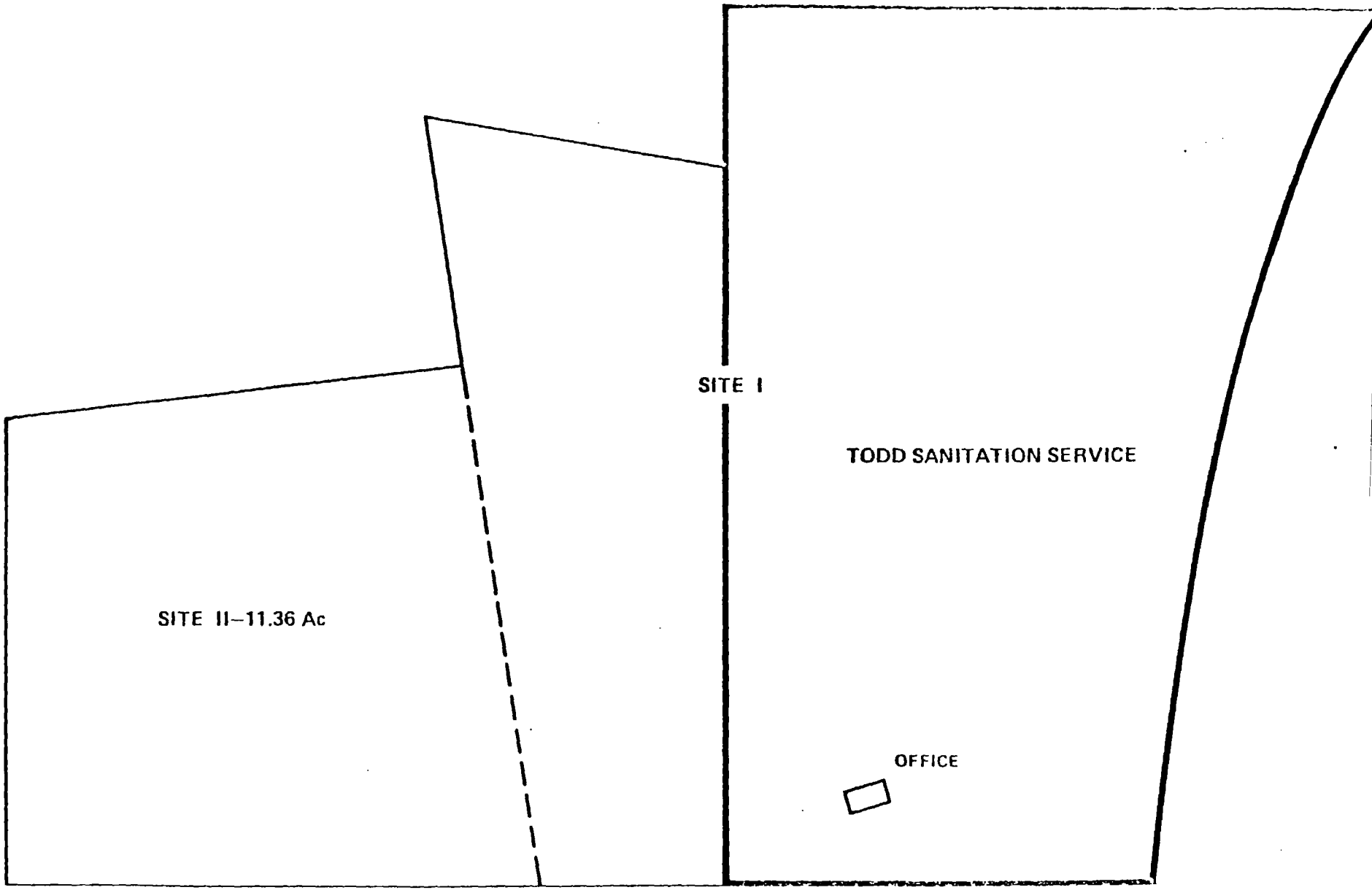
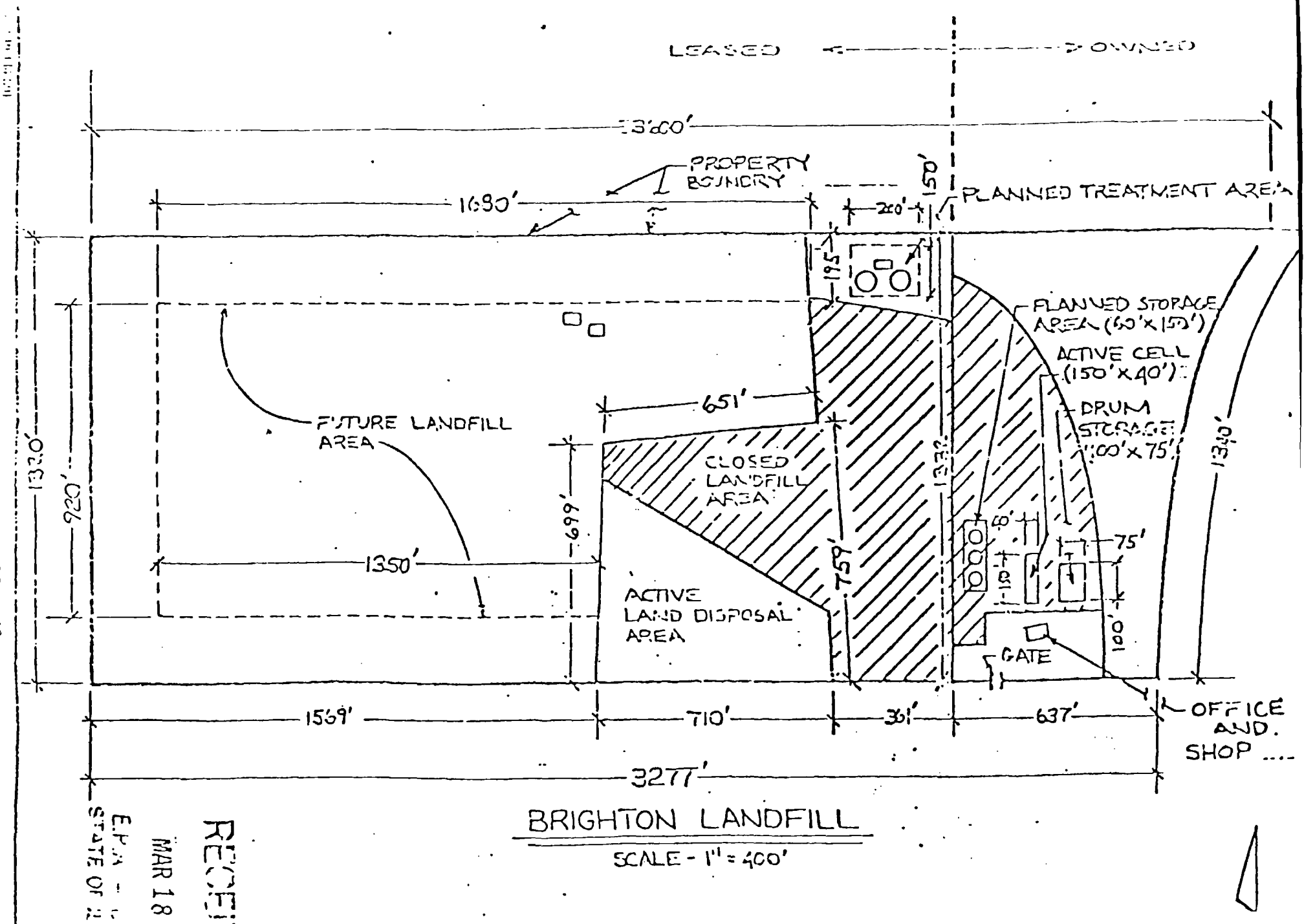
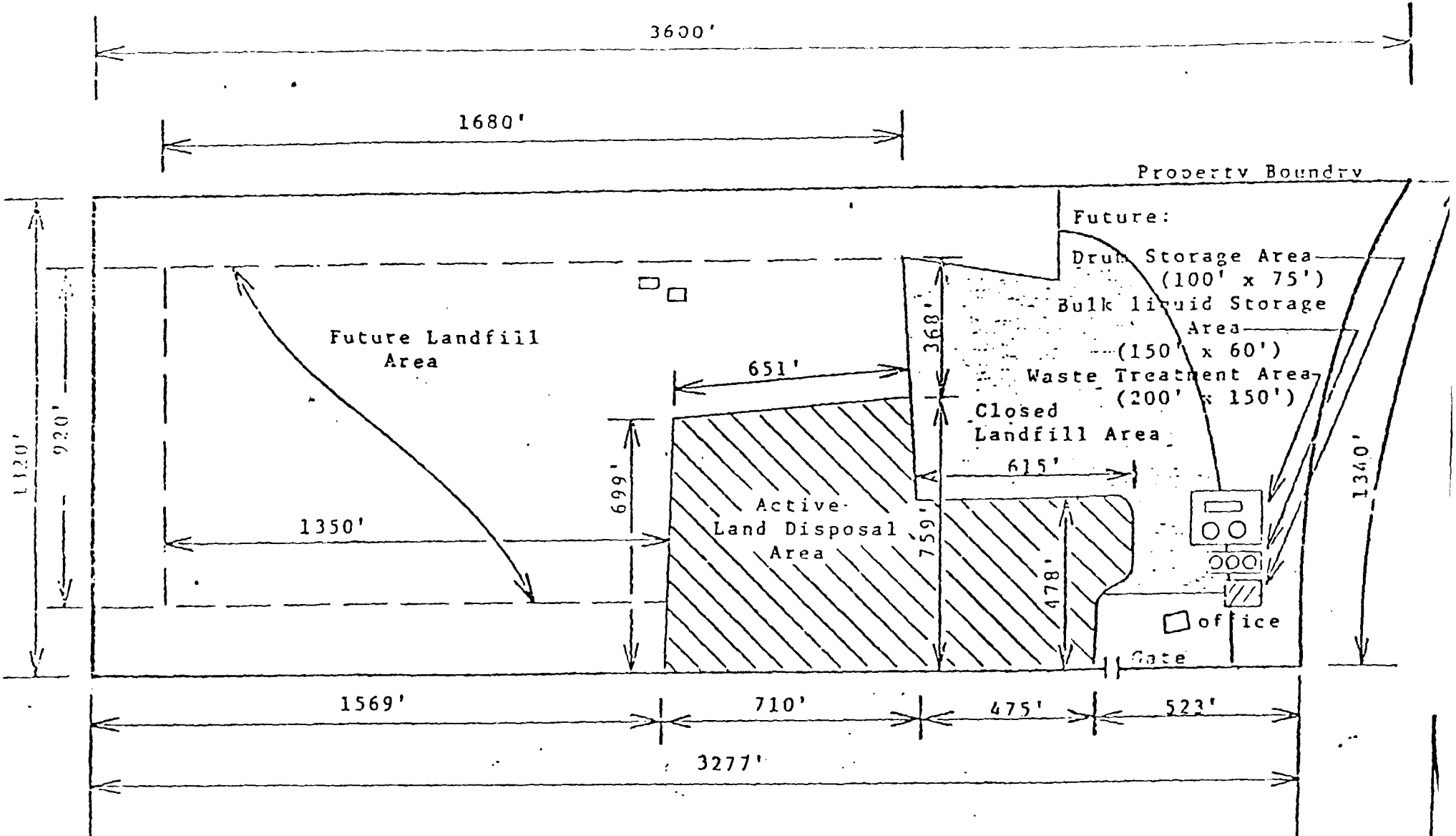


Figure 10. Brighton Landfill - 1971


LEASED
OWNED
3300'
PROPERTY BOUNDRY
1690'
150'
200'
PLANNED TREATMENT AREA
195'
PLANNED STORAGE AREA (60'X15')
ACTIVE CELL (150'X40')
DRUM STORAGE (100'X75')
651'
FUTURE LANDFILL AREA
CLOSED LANDFILL AREA
1332'
1340'
1330'
920'
669'
1350'
ACTIVE LAND DISPOSAL AREA
757'
60'
75'
15'
100'
GATE
1569'
710'
361'
637'
OFFICE AND SHOP
3277'
BRIGHTON LANDFILL
SCALE - 1" = 400'
RECEIVED
MAR 18 1
EPA
STATE OF
FIGURE 11 ACTIVE CELL 150 X 40

no leachate collection system has been installed, nor is the excavation complete. The complete conditions of this supplemental permit are contained in Appendix C. Some scope of the future operations can be gained from a review of Figure 12. It should be noted that the portion of the facility (partly in Site I and partly Site II was used after November 19, 1980) is subject to RCRA closure requirements but has never gone thru closure. The State of Illinois is not requiring an artificial liner for the 60 ft. deep trenches. Waste material is now being "stockpiled" in 18 feet deep x 3.5 feet wide trenches awaiting the construction of the final burial vault now being excavated in the southwest corner of Site II. Information on the material accepted by Brighton Landfill for disposal is contained in Appendix C. The complete history of environmental monitoring and compliance is the subject of Section 4.



BRIGHTON LANDFILL

scale - 1" = 400'

4.0 ENVIRONMENTAL COMPLIANCE

4.1 Permits

4.1.1 State of Illinois

Brighton Landfill Inc. holds two valid operating permits (i.e., LPC 1178020I and LPC 1178020З). The permit for Site I was issued November 11, 1975, and Site II September 13, 1979. Site I was originally permitted to Todd McKee but was transferred to Com-Pak Engineering. Supplemental permits have been granted from time to time to allow additional waste types or add additional depth to the trenches (see Appendix B).

Since a September, 1983 State of Illinois inspection, the state has issued a series of compliance notices in an effort to resolve certain operational difficulties at the Brighton site. These notices are contained in Appendix D. It is recommended that the apparent violations listed in the April 16th letter, if not already corrected by the operator, could be made conditions of insurance. While many of the violations are correctable through changes in operating procedures, the most serious violation involves the apparent lack of an adequate groundwater monitoring program. A reinspection in May of 1984 suggested that many of the violations had not been corrected to the satisfaction of the state. December, 1984, inspection results are not available to Versar at this time.

4.1.2 RCRA Permit

By virtue of operating Sites I and II prior to November 19, 1980, the Brighton Landfill has interim status as a TSD (USEPA #ILD 000667139). The Part A is included as Appendix E. Part B was called in late 1983 and resulted in a Part B submission and two notice of deficiency letters. The major issue raised in the letters continues to be the lack of an adequate groundwater protection program. The deficiency letters are included as Appendix F.

4.1.3 Groundwater Monitoring

The following review of groundwater conditions at the Brighton Landfill are excerpts from reports of the site geotechnical consultant, Mike Rapps, and reports prepared by John Mathis and Associates.

Thirty-one (31) groundwater monitoring wells have been installed around the waste management area. Well designations and locations are shown in Figure 13. Construction details regarding well casings, seals, depths, pertinent features are included in Appendix H.

Figure 14 introduces three profiles (Figures 15, 16, and 17) which give the reader another view of the geology of the site. After extensive drilling, M. Rapps has concluded that there is a zone of shallow groundwater located near the surface of the site and that isolated and unrelated groundwater occurs at greater depths:

> Previously submitted reports identified a zone of shallow groundwater located near the surface and which generally follows a direction of flow dictated by surface contours. It should be noted that perched groundwater is apparently non-continuous as it was encountered in some but not all of the borings. Note also an apparent seasonal fluctuation as evidenced by boring 7 drilled in May and the adjacent 7a drilled in December. Perched water encountered in the former was absent in the latter. Where present, the shallow groundwater tends to occur at the interface of loess materials and denser underlying till and in thin sand stringers found in the upper till deposits. It is not present throughout the entire site.
>
> The most recent drilling encountered isolated areas of deeper groundwater occurring at elevations in the range of 575' to 585'. Continuity of flow in this region is speculative although it is clear that deeper flow, if any, does not exist throughout the site "per se". In fact groundwater, shallow or deep, was not encountered at all in borings 18 and 19, even at a depth up to 85'. This is not to discount the possibility of a deeper zone of continuous flow, although evidence suggest it to be unlikely.
>
> In review of all available subsurface data it seems clear that underlying groundwater is sparse in quantity and quite varied in its distribution. Aquifers, at least in the conventional sense of the term, do not exist at the site. Based on seasonal flux observed in the shallow zone and lack of continuity in either the shallow or deep zones, the insitu porous materials are of questionable reliability as a source of water supply.

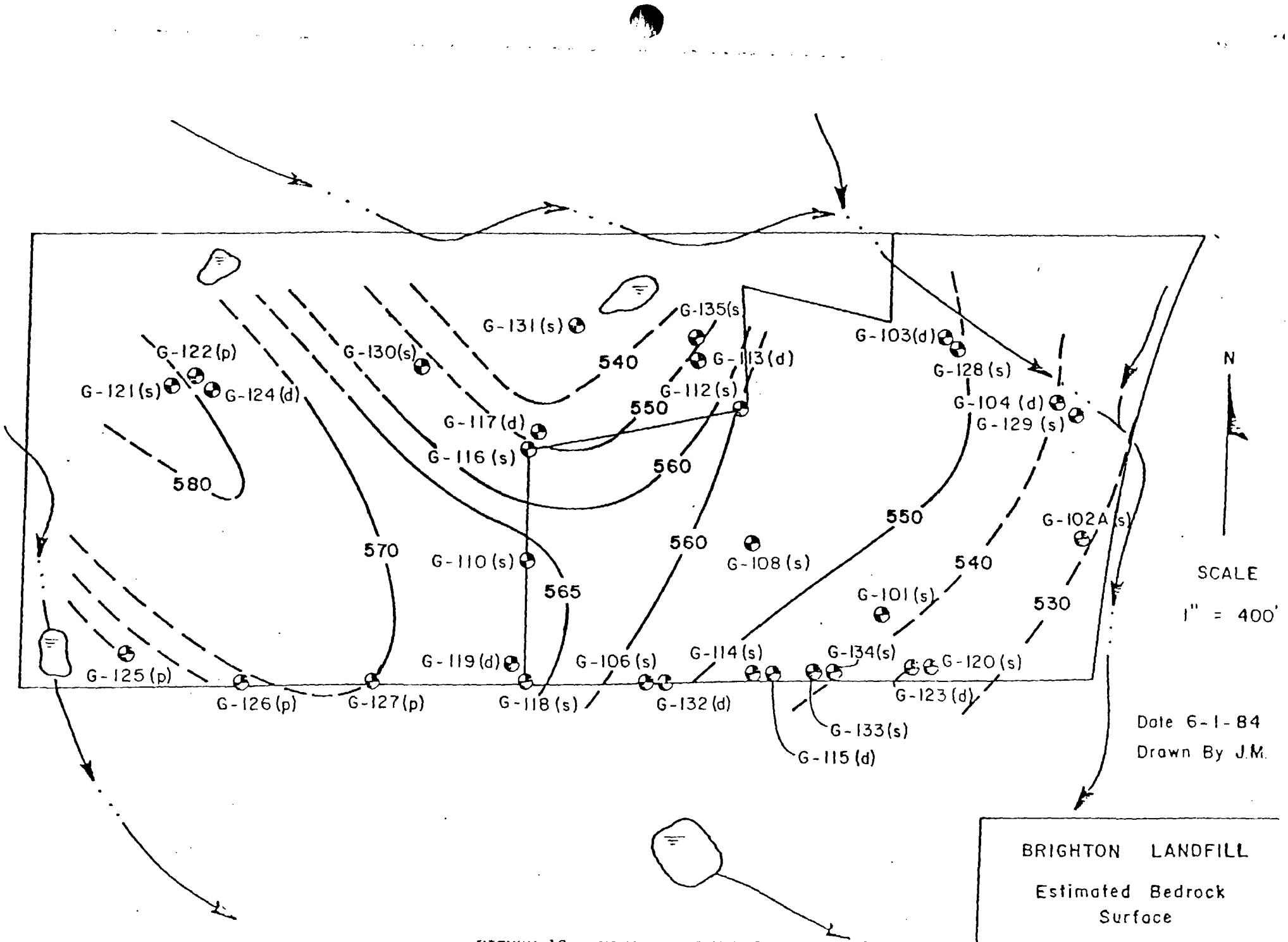


FIGURE 13 MONITORING WELLS

M. Rapps Associates, Inc.

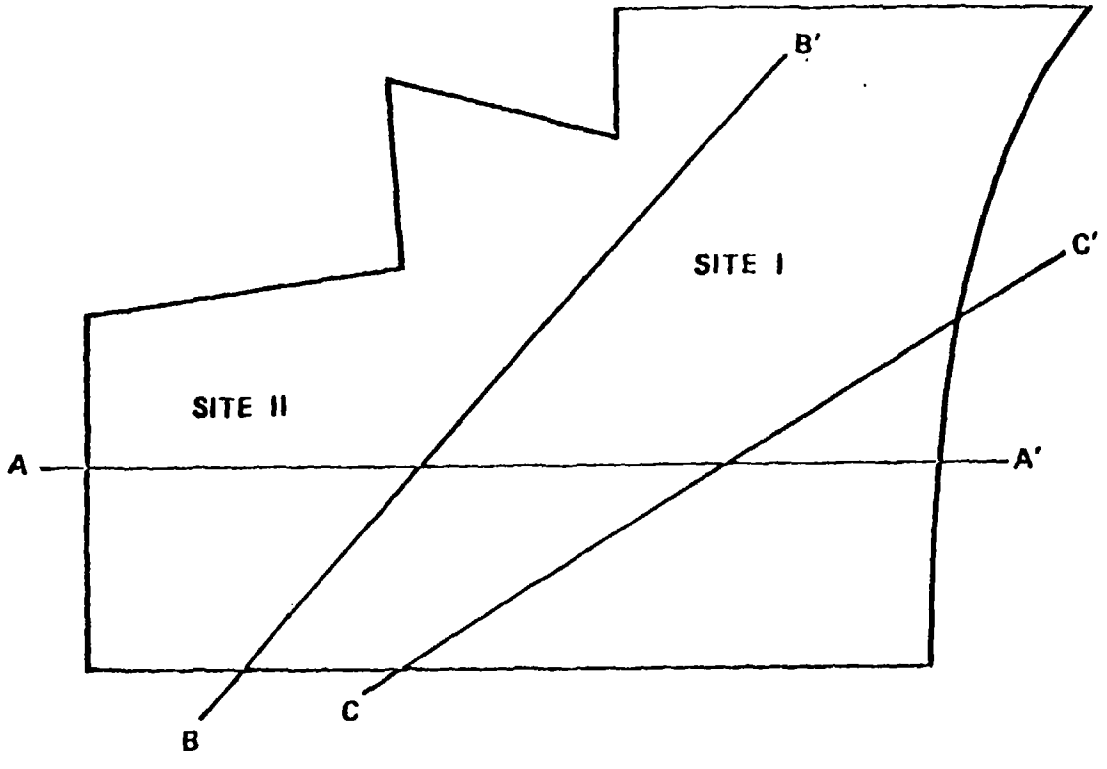


FIGURE 14 BRIGHTON LANDFILL PROFILES

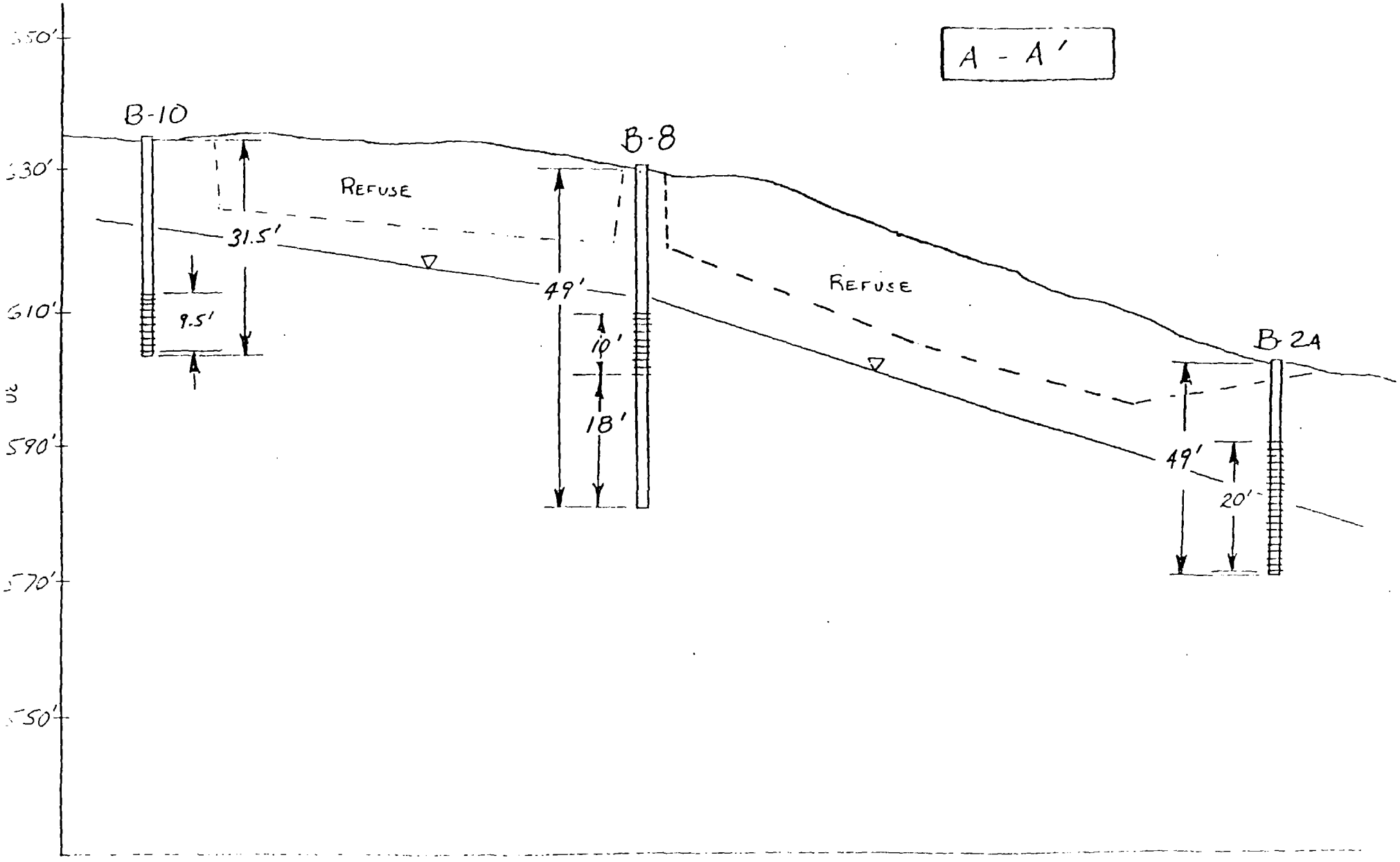


FIGURE 15 A-A' PROFILE

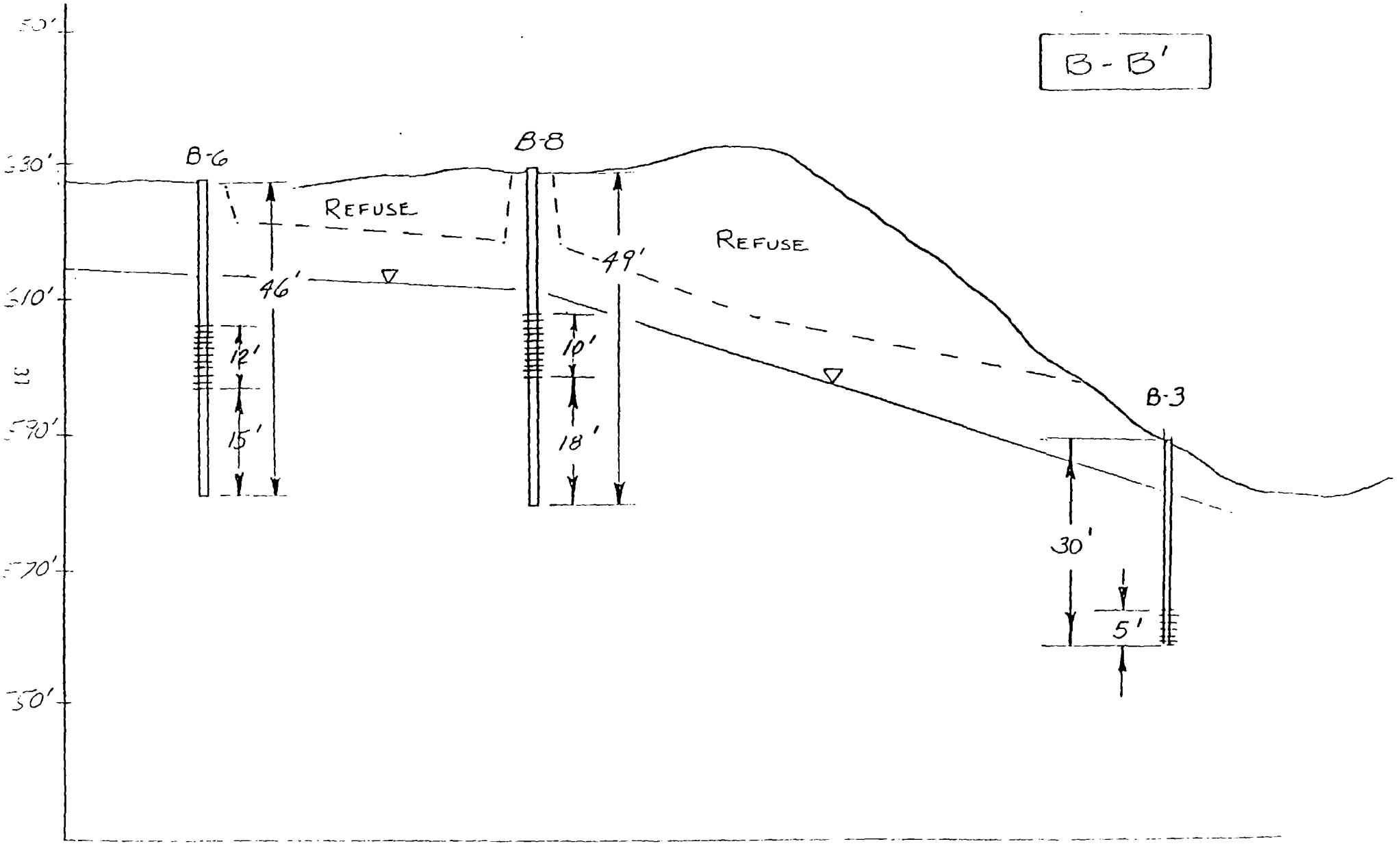


FIGURE 16 B-B' PROFILE

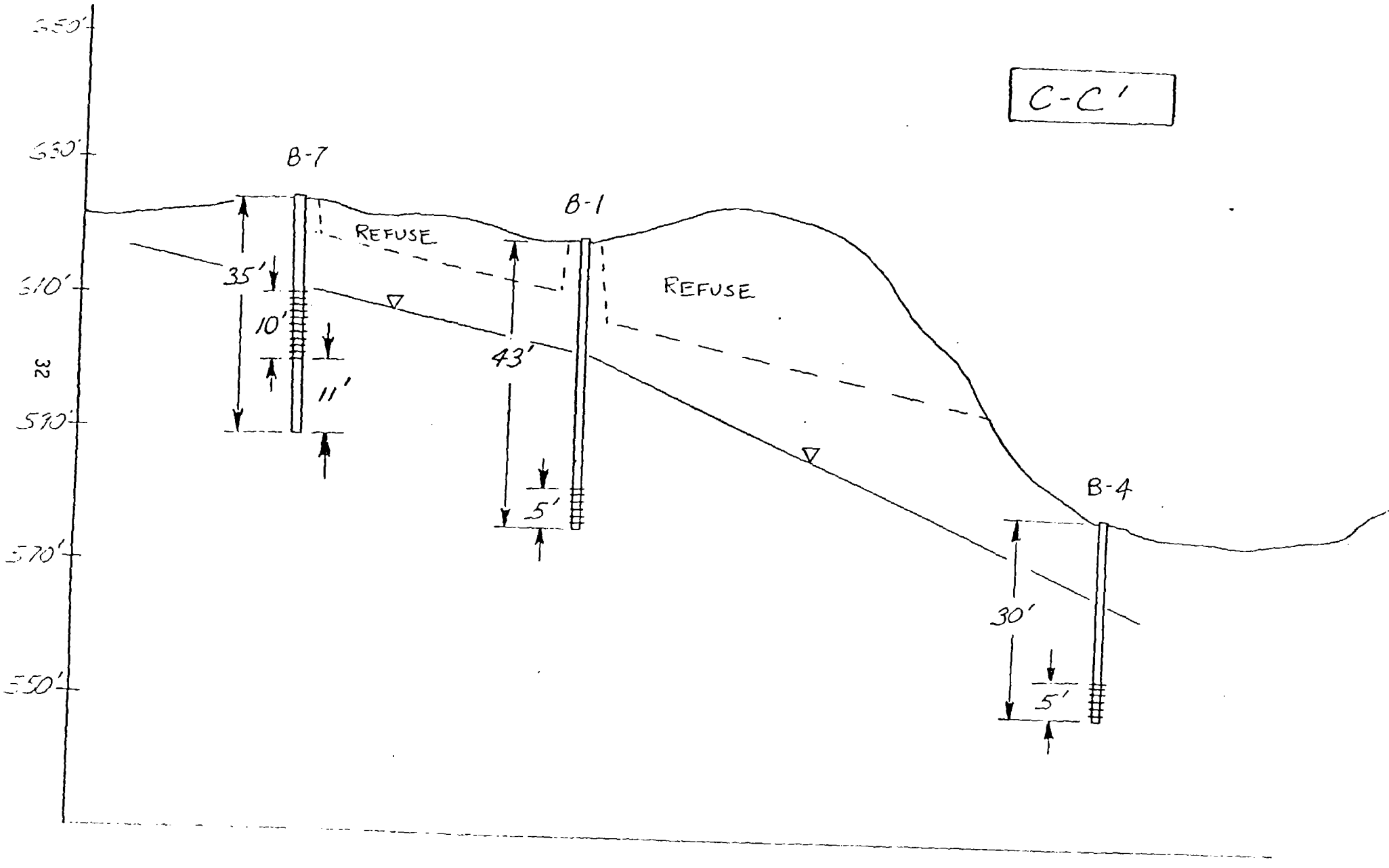


FIGURE 17 C-C' PROFILE

Conditions described pose certain obvious problems as regard effective and meaningful groundwater monitoring. But more importantly, the porous zones, independent of yield potential, can serve as possible conduits for exiting leachate. As such, permeable deposits should be sealed whenever encountered.

It is important to note that excavation to 50 to 60 ft below the current surface (as per approval of IEPA), still leaves a substantial buffer of tight clay between the excavation invert and bedrock and which exceeds ten feet as minimum. The excavated area in the southwest of Site II will feature a leachate collection system consisting of stone filled channels extending along the lowest portions of the excavation borders to large stone filled sumps fitted with 4" riser pipes. The detection monitoring program has been in existence in bits and pieces sine 1979. As early as 1979 inordinate levels of cadmium and lead were detected in upgradient wells. More recently, in detection monitoring (see Appendix I) statistically significant test results occurred between down gradient wells 2A and 3 with upgradient well No. 9 relative to pH (No. 3 and No. 2A) and TOX No. 2A. As per the RCRA and state of Illinois regulations the state environmental administrator was notified on April 4, 1984 (Appendix J). At this juncture, a major difficulty is the need to clarify the adequacy of Brighton Landfill's groundwater monitoring assessment program, which is designed to assess the extent of contamination that may exist below the landfill and to assess the possible contribution of the landfill materials to any such contamination as may exist.

4.2 Raw Material Storage

All raw material is stored inside the maintenance/office building at the entrance to the site. The maintenance area contains 7-55 gallon drums of oil and 2-20 gallon drums of lubricant. The garage area has no floor drains, in fact part of the garage floor is compacted earth.

4.3 Tank Management and Spill Control

Brighton Landfill has two underground storage tanks (4 and 5 years old) which have a capacity of 500 gallons and 1000 gallons. Versar has discussed with Brighton the need to have these tanks tested.

4.4 Site Observations

4.4.1 Security

The current active portion of Site II is surrounded by a six-foot fence. The resulting enclosure has two gates, both closed after day light hours.

4.4.2 Safety

Site safety was taught as part of the environmental training program presented by REACT, of St. Louis, Missouri.

4.4.3 Housekeeping

The appropriate record keeping appears to be taking place in terms of the manifest and paint filter test results for treatment sludges.

4.4.4 Environmental Organization

Gene Evans, is the president of Com-Pak Engineering, the parent company which operates Brighton Landfill. As such Mr. Evans is the highest ranking environmental official at the site. In recent years Mr. Evans has taken an active part in the day-to-day operations of the site. P. Douglas Tickner is the emergency coordinator, facility supervisor and manager. Brighton employs five other men to work as equipment operators and maintenance mechanics.

4.4.5 Training

Most of the current employees have participated in a hazardous waste TSD training program developed by REACT of St. Louis, Missouri.

5.0 REGULATORY AGENCY CONTACTS

The relevant Illinois EPA regulatory contacts are Pat McCarthy (618-345-4606) at the Collinsville office of IEPA and Jim Moore in Springfield, Illinois. Versar contacted Mr. McCarthy concerning the site visit he made on December 11th, 1984 but was unable to learn anything concerning the outcome of that inspection.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

Versar has concluded that the land disposal of hazardous waste carries a higher than average risk. Given the current uncertainties concerning the exact extent and source(s) of the subsurface contamination presently at the facility and given that the facility has not yet installed a leachate collection system, Versar concludes that the probability of environmental impairment liability resulting from the hazardous waste land disposal facility operated by Com-Pak at Brighton, Illinois, is medium to high (above average) when compared to similar facilities. The reasons for this rating are as follows:

Negative Factors

- The facility does not have artificial barriers or underdrains to intercept and collect leachate. Therefore, environmental emissions are more likely at this landfill than at one which meets standards for new land disposal facilities under RCRA. It should be pointed out that the current excavation to 60 ft will contain a leachate collection system and bottom and side walls, lined with recompacted clay with permeability less than 1×10^{-8} cm/sec. The site operator has expressed his intention to deposit the waste from the one trench in Site I and all waste in Site II into trenches of this type construction.

- Given the unusual geophysical conditions at the site the determination of potential releases of pollutants from the site is complex. The previous or potential contributions of the facility to the degradation of the groundwater is difficult to separate from the contribution of the natural environment. This is because the current monitoring network is not generating data which are conclusive in this regard. The monitoring program to be successful must use parameters that are both indicators of landfill-related contamination and which are also contributed by any off-site source in only very small concentrations. Being an agricultural area, ammonia and nitrates could be coming from fertilizer and past pesticide applications could interfere with the TOC and TOC contribution of the coal particles is also a factor. All items considered, "chlorides" seems to hold the greatest promise as a true indicator of landfill contributed contamination.

- The current disposal technique (trenching) is occurring at an elevation above that allowed by the facilities permit. This aggrevates the problem of containing the surface run-off. It should be noted that this problem is temporary, while Site II is used as a kind of storage area awaiting final disposal in the excavation at the southwest corner.

- Two legal actions are pending against the facility. A "3008" compliance letter under RCRA and a suit brought by the state attorney general's office claiming that the facility presents a common-law nuisance. Concerning the notice of deficiency letters, the facility owner/operator has made, and is continuing to make, reasonable efforts to resolve what USEPA perceives to be problems with Brighton Landfill's monitoring program. Other items outlined in the deficiency letters are currently being corrected after consultation with the state.

Favorable Factor

- The facility is located in a non-urban agricultural area.

- Only one adjacent landowner is using groundwater as a drinking water source. The landowner is upgradient and can connect to a public water supply.

- The hazardous waste (received since November 19, 1980) currently in place at Site I and II, is proposed to be moved at some later date to a disposal area just to the west of Site II. If this new site were constructed so as to meet the disposal performance standard outlined by IEPA in the development permit, then the potential risk from non-sudden releases will be reduced.

- Only 20 percent (by volume) of the waste in place at the facility is classified as hazardous. Hazardous and non-hazardous waste is not now, nor was it in the past, segregated. The entire facility (Sites I and II) must therefore be considered a hazardous waste disposal facility. Mixing hazardous sludges with non-hazardous municipal waste is an inexpensive "treatment" technique, but in the long run will take up valuable space in the landfill. The facility would be well advised to consider a more formalized approach to fixation or stabilization.

6.2 Recommendations

- Brighton Landfill should continue to implement its groundwater quality assessment plan, which could yield defensible results as to extent of contamination and potential contributions of the landfill.

- Brighton Landfill should continue to work with USEPA and IEPA to resolve those issues appearing in the "letters of deficiency" relative to Brighton Landfill's groundwater monitoring and assessment programs.

- After the one hazardous waste trench on Site I has been moved to Site II Site I should be "RCRA" closed.

- Diesel fuel storage tanks at the site should be tightness tested.

- Material being "stored" on Site II should be covered to prevent rainwater contact with hazardous waste and decrease infiltration.

- Since the 60 ft excavation could reverse inward the groundwater flow; groundwater (leachate) pumping and treatment should be anticipated.

- The system of cataloging waste burial at Site II in 100 ft squares should be backed up by some form of in the field benchmarks.

- Given what the current subsurface pollution has not caused damage to any known drinking water supply, the site should pursue definition and remedies to the current contamination while placing future and previous waste in a more environmental secure trench.

Finally, it should be noted that the applicant's site is in transition. The new trenches at the 60 ft level, coupled with a workable leachate collection system represent the potential for improving the environmental secureness of the site. On the other hand, the owner/operator must move forward to resolve the need to assess the extent and source(s) of subsurface contamination. As is standard, Versar offers our recommendations to be considered as potential conditions for insurance.

7.1 SITE VISIT PERSONNEL

The Brighton Landfill site was visited by Robert Peters on November 18 and 19, 1984.

7.2 APPENDICES

Appendix A. Photos

Appendix B. Stream Survey

Appendix C. Operating Permit Conditions

Appendix D. Hazardous Waste Received

Appendix E. State of Illinois Compliance Letters

Appendix F. Revised Part A Permit

Appendix G. Notice of Deficiency Letters

Appendix H. USEPA Compliance Order and Response

Appendix I. Groundwater Monitoring

Appendix J. Detection Monitoring

Appendix K. Notice of Contamination to IEPA

Attachment EA-2

STATE OF ILLINOIS
DEPARTMENT OF
REGISTRATION AND EDUCATION
Ronald E. Stackler
DIRECTOR, SPRINGFIELD

BOARD OF
NATURAL RESOURCES
AND CONSERVATION
..... CHAIRMAN
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GEOLOGY ..... LAURENCE L. SLOSS
SOUTHERN ILLINOIS UNIVERSITY .....
ELDERT H. HADLEY
UNIVERSITY OF ILLINOIS .....
WILLIAM L. EVERITT

Illinois State Water Survey

WATER RESOURCES BUILDING • MAIL BOX 232, URBANA, ILLINOIS 61801 • AREA CODE 217
605 E. SPRINGFIELD, CHAMPAIGN PHONE 333-2210

WILLIAM C. ACKERMANN, CHIEF

December 3, 1974

Mr. C. L. Sheppard
Sheppard, Morgan & Schwaab, Inc.
215 Market Street
Alton, IL 62002

Dear Mr. Sheppard:

This is in response to your request concerning the groundwater conditions in the E 1/2, SE 1/4, SW 1/4 and the W 1/2, SW 1/4, SE 1/4, Section 30, T. 7N., R. 9W., Macoupin County. It is my understanding that a permit for an existing landfill site is being applied for.

Our Division has record of only 2 wells within a 2 mile radius of the area of interest. However, from available regional data, it appears that large-diameter (24 to 36-inch) augered wells are probably used for most farm and domestic water supplies in this part of Macoupin County. These wells generally obtain their water from thin sandy and silty zones contained in the glacial materials. The glacial materials are estimated to be about 20 to 30 feet thick in the general area of interest.

The underlying bedrock is of Pennsylvanian age and is predominately shale. A few farm wells have tapped sandstone and limestone layers in the upper part of these rocks. Below a depth of about 300 feet water contained in the rock units is generally too highly mineralized for most uses.

Sufficient data is not available from our files to establish direction of water movement in the glacial materials and bedrock units. A water level measuring program and sampling program for mineral constituents from both aquifer units may be advisable to determine direction of water movement and baseline water quality. The enclosed Reprint 111 indicates that the area of interest probably has a

BRIGHTON LANDFILL
Ten (10) Largest Waste Streams

Generator	Waste	Haz. Waste No.	Appendix VII Constituents	Waste Volume*
Olin	Z-6 sludge	K044, K046 D008, F008	Pb, CN^-	30,089 Yd^3
Olin	Z-3 Inc. Ash	D008	Pb	2,851 Yd^3
Laclede	Arc Dust	K061	Cr, Pb, Cd	1,142 Yd^3
Olin	Z-17 Baghouse Dust	D008	Pb	1,087 Yd^3
TWI	Incinerator Ash	D008	Pb	870 Yd^3
Olin	Ballistics Sand	D008	Pb	737 Yd^3
Olin	W.W. Media	D008	Pb	575 Yd^3
Owens-Ill.	No. 2 Furnace dust	D006, D008	Cd, Pb	204 Yd^3
TWI	Roasted Gravel	D008	Pb	168 Yd^3
Amoco	Tank Bottoms	D008	Pb	176 Yd^3

* estimates based upon waste receipts from 1980 through 1984

ATTACHMENT EA-6

M. Rapps Associates

2387 WEST MONROE, SUITE 123, SPRINGFIELD, ILLINOIS 62704 — (217) 787-2118

ENVIRONMENTAL ENGINEERING

September 7, 1984

Brighton Landfill
1201 Dunn Road
St. Louis, Missouri 63138

ATTN: Gene Evans

Dear Gene:

On May 15, 1984, personnel from this office conducted a stream survey of the meandering branches that make up the bulk of Brighton Landfill's perimeter. The branches eventually converge and flow into the western fork of the Wood River. Since the various streams collect discharging groundwater,in addition to run-off, stream analysis is an important tool for monitoring the impact, if any, of the landfill. A total of twenty four samples, each split into two replicates, were collected along the various stream lengths. The samples were then field analyzed for specific conductance and pH. The analyses were performed with a HYDAC Digital Conductance, Temperature and pH Tester, which has an accuracy of $\pm$ 2% when testing for conductivity and $\pm$ 1% for pH.

Specific conductance is a measure of a solution's ability to conduct an electrical charge. It is expressed as micro ohms per centimeter at a given temperature. The significance of this reading is that specific conductance is directly proportional to the total dissolved solids content of a solution (i.e. the higher the specific conductance reading, the greater the concentration of total dissolved solids present).

By definition pH is the negative logarithm of a concentraion, either hydrogen ions (i.e. acids) or hydroxide ions (i.e. bases). It is a dimensionless quantity from 0 to 14. For our use it is important to know that a neutral solution has a pH of around 7, an acidic solution has a pH of less than 7, and a basic (Alkaline) solution exhibits a pH of greater than 7.

Sampling protocol used in the survey included the following:

- a sample was taken and analyzed at minimum intervals of 500 feet and/or at the convergence of two streams.

- the HYDAC Tester was calibrated according to manufacturer specifications prior to the stream sampling. Subsequent periodic calibration checks were performed during testing to ensure uniformity.

- each sample was split into two (2) replicate samples and each replicate value was recorded. These two value were averaged to compensate for minor differences in the readings. (Note: If any test values varied more than 10%, that sample was discarded and another sample was collected, analyzed, and the results recorded).

- at the end of each analysis, distilled water was used to clean the sampler and tester. This was done to eliminate possible cross contamination from sample to sample.

Survey results and this office's interpretation of same are discussed as follows. The enclosed location map and photos are used as a reference:

Branch No. 1:

The highest specific conductance reading of the survey (1005 micro-ohms) was obtained in this branch, upstream of Brighton Landfill property. That value is quickly diluted as the stream meanders through the South East corner of the property to result in a downstream value of 855 micro-ohms. This branch is far upstream (upgradient) of any landfill activity. It is our feeling that the elevated Specific Conductance is most likely attributable to runoff from the feed lot located West of the site or to agricultural soil amendments.

The stream pH increases in inverse proportion to the observed decrease in Specific Conductance. This is possibly a reflection of aerobically decomposing animal waste (generally acidic conditions) and the precipitation of dissolved material as the stream is gradually made more alkaline through dilution.

Branch No. 2:

This stream, one of the longer branches, flanks most of the Northern property line with the better part of it being upstream of actual landfill activity. Measurements taken along the length of this branch show a gradual rise in both pH and S.C., followed by a sharp reduction in both parameters and thence a sharp increase in both. This is followed by a steep increase in S. C. and sharp decrease in pH and then a sharp reduction in the former and sharp increase in the latter. In the final analysis, the streams Specific Conductance from West to East increases from 767 to 865. This is roughly equivalent to a 75 ppm increase in dissolved solids over that length. Over the same length, pH increases from 8.28 to 8.58. And, unlike the other branches, this stream displays wild fluctuations in the indicator levels as opposed to mild increases or decreases. There are probably a number of reasons for this which may include agricultural runoff, septic tank discharges and similar sources. But, apart from the normal rural water quality factors, the survey crew found evidence of some unexpected pollution sources.

Photo No. 1, taken near the point of the 766 S.C. reading in Branch No. 2 identifys a clutter of refuse (car parts, tires, old refrigerators, etc.) apparently dumped along the Northern stream bank. Photo No. 2, taken at the approximate location of the 859 S.C. reading shows more debris on the North bank of the stream, including several 55 gallon steel drums bearing the name "Specialty Products Company". Photo No. 3, taken nearby shows a milkly colored plume, similar to an oil slick, floating on the stream surface. The plume emerged from the assortment of debris on the North Bank. Photo No. 4, taken at the approximate location of the 953 S.C. reading, identifys what appears to be an old dumping area on the South bank of the stream. This dumping apparently occurred a very long time ago in that the roots of an old tree have grown through many of the tires and tire tubes visible in the photo. This dumping, which is fairly common in ravines in rural areas, probably predates Todd McKee's original landfilling activity.

Branch No. 3:

The background sample of this branch (S.C. 877, pH 8.49) was considered important in that it was previously identified that considerable dumping of industrial residues has occurred along the Western bank upstream of the convergence with branch No. 4 (please refer to photos #5, #6, and #7).

It is not known if the indicated readings are "normal" for this branch except that it can be noted that they are at variance with upstream readings in Branches No.'s 2 and 5.

Branch No. 4:

At the outset we considered this branch to be the most important of those sampled. This is because it is the stream that is closest to any refuse deposited by the landfill and because the gradient of discharging groundwater passing beneath the landfill makes its sharpest descent along the western stream banks. Not surprisingly a mild increase in both S.C. and pH was noted. Specific Conductance rose from 855 micro-ohms to 886 micro-ohms. The difference translates to an increase in dissolved solids on the order of 20-25 ppm. The noted change in pH, from 8.68 to 8.77, is very minor.

It must be recognized that the minor changes in stream quality need not be the result of the landfill situated to the west because those changes may, in fact, reflect in whole or part, unknown factors on the opposite stream bank. However, it can be inferred, and this is the highest value of the stream survey, that if the landfill is impacting stream quality, at its most vulnerable point, that impact is very minor. A change of 20-25 ppm of dissolved solids is not particularly significant.

Branch No. 5:

This stream, which is the recipient of discharge from the village of Brighton's Municipal sewage treatment plant, is important only in that it converges with Branch No. 4 to form Branch No. 6. The effects of treated sewage on this stream, based only on the limited parameters of S.C. and pH, are not apparent in that the S.C. value is one of the lowest recorded during the survey.

Branch No. 6:

This stream, formed by the convergence of Branches No.'s 4 and 5, also passes reasonably close to previously deposited refuse in the landfill. Nevertheless, the four readings taken in this branch show a gradual and consistent decline in both S.C. and pH. This is despite the presence of considerable trash dumped along the banks near where the township road crosses the stream. Much of the debris is household refuse that has apparently been dumped by passing motorists.

Branch No. 7:

This stream contains, in large part, the overflow from a farm pond located South of the landfill. It is not known if the pond is used for livestock watering or similar such use, but the water in the resultant stream reflects a higher S.C. than the branch with which it converges.

Branch No. 8:

This stream reflects the combination of branches No.'s 6 and 7 and suggests that, of the two, No. 6 is clearly the dominant stream. The readings in this branch, which are the final measurements made in the survey, are 786 micro-ohms and 8.46 for S.C. and pH, respectively. The former equates to a total dissolved solids concentration which likely falls in the range of 525-600 ppm.

Observations

1. It is difficult to guage, based only on the observations at hand, what the pH and S.C. of streams in the area might be in a pristine state. An educated guess is that S.C. would probably fall in the range of 700-800 and pH between 8.0 and 8.7. There is nothing unusual about the former but the latter tends to be fairly alkaline.

2. If there is a contribution from the landfill, it most likely manifests itself in branches No.'s 4 and 6. Based only on the indicator parameters, that contribution, if any, is insignificant.

3. Two problem areas, apparently not related to the landfill, are Branches No.'s 1 and 2, and particularly the latter. Branch No. 3 is also suspect given the known presence of industrial waste along its upstream banks.

Branch No. 2 seems to reflect the impact of many different disturbances, several of which are identified in this report. Moreover, there is little correlation between the wildly fluctuating values of S.C. and pH. This is in contrast with the other branches where there are very clear correlations. S.C. and pH, vary inversely in Branch No. 1 and directly in Branches No.'s 4 and 6.

4. Specific Conductance and pH are only indicator parameters and, for practical purposes, are suited only to the gross examination of water quality. S.C.'s usefulness is limited to dealings with inorganic contaminants and pH, although it can reflect

the impact of organic or inorganic acids or bases, is generally quite limited without companion tests. Neither parameter is useful in detecting contamination by trace pollutants such as heavy metals or trace organics. Still, we are very pleased with the results of the survey and the usefulness of the field instrument. We are confident that if the landfill were responsible for a significant impact on stream quality the survey would likely have given some indication of same. Moreover, the flourish of wild life (i.e. snakes; rabbits, frogs, beaver, etc) and absence of stressed vegetation in the stream bottom suggest further that if there is impact, it is very subtle.

Based on the work presented herein, it is our intention to approach U.S. EPA with the concept of using stream quality as a measure of landfill impact. We think this consistent with the broader intent of that Agency as regards both hazardous waste and water pollution. As a practical matter, the ultimate environmental impact of the landfill, if anv, can be measured in the streams which flank the site. This is because groundwater which exists beneath the site ultimately discharges to the various branches.

I hope that you find this report useful. Please let me know if you have any questions.

Thank you.

Sincerely,

Michael W. Rapps, P.E.

Timothy J. Sheehan, P.E.

MWR:TJS:jh

cc: Mohan, Alewelt & Prillaman

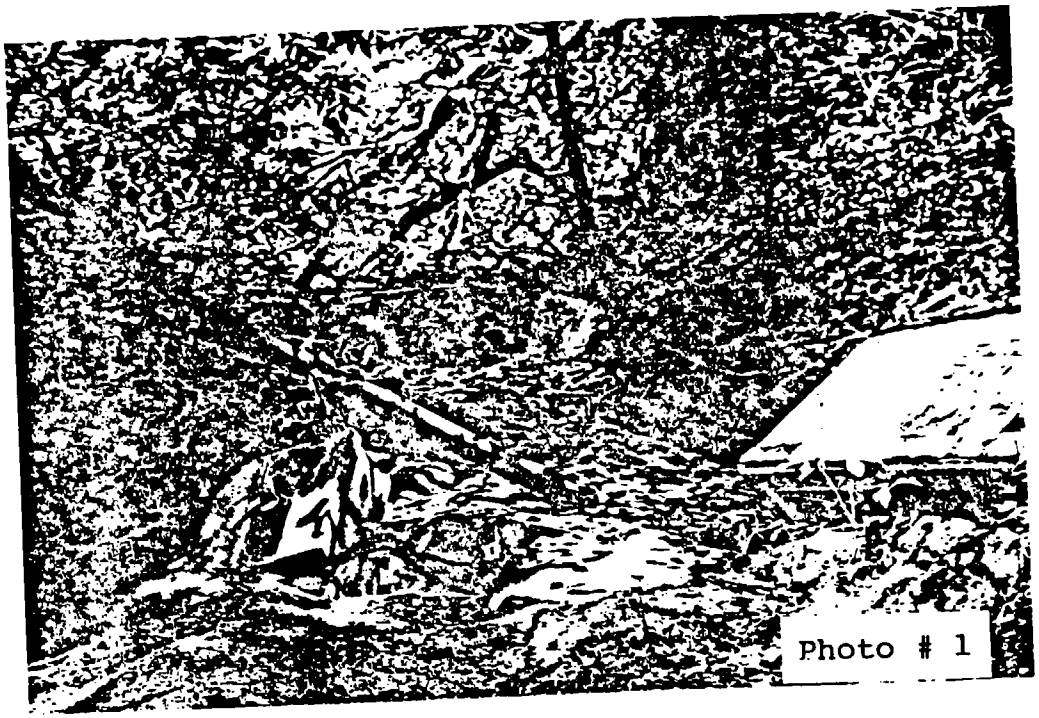


Photo # 1

Photo # 2

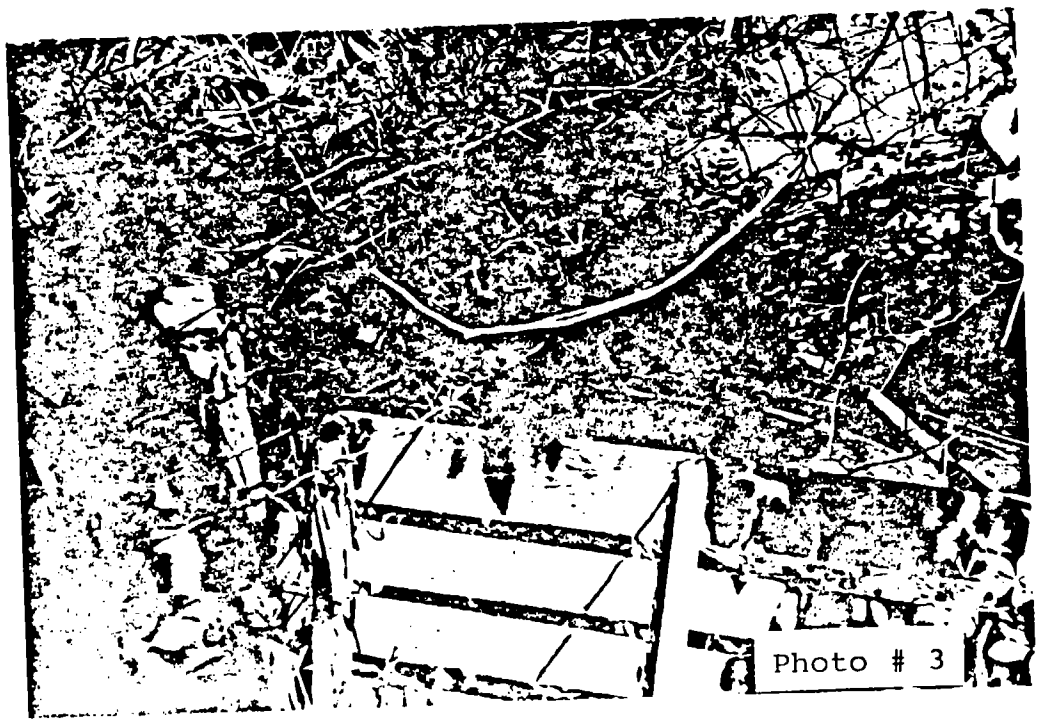


Photo # 3

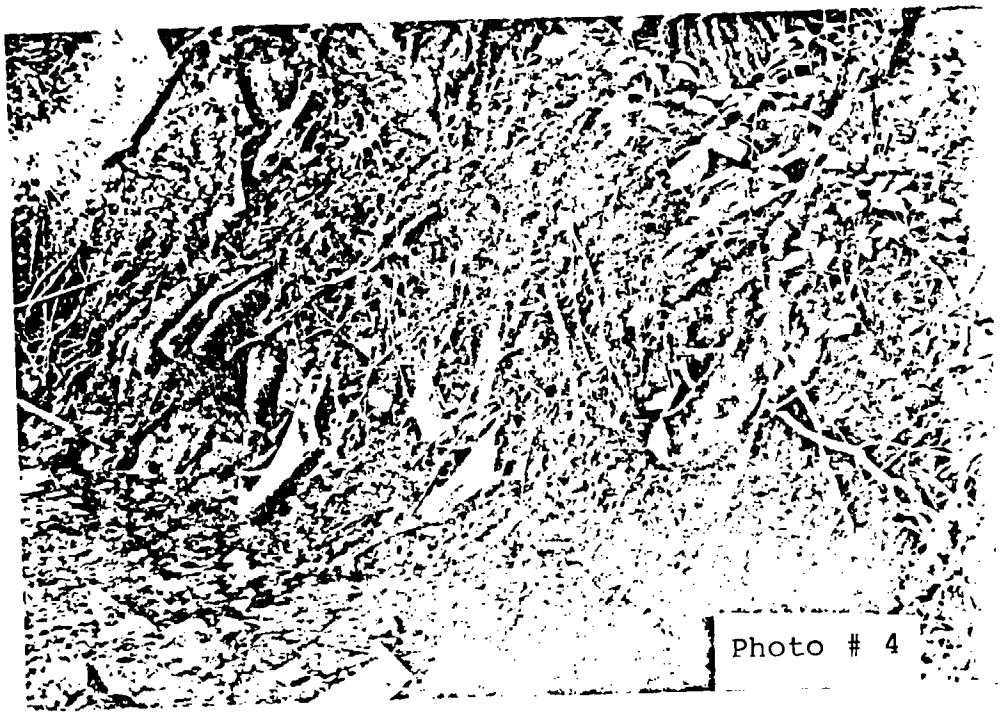


Photo # 4

Photo # 5

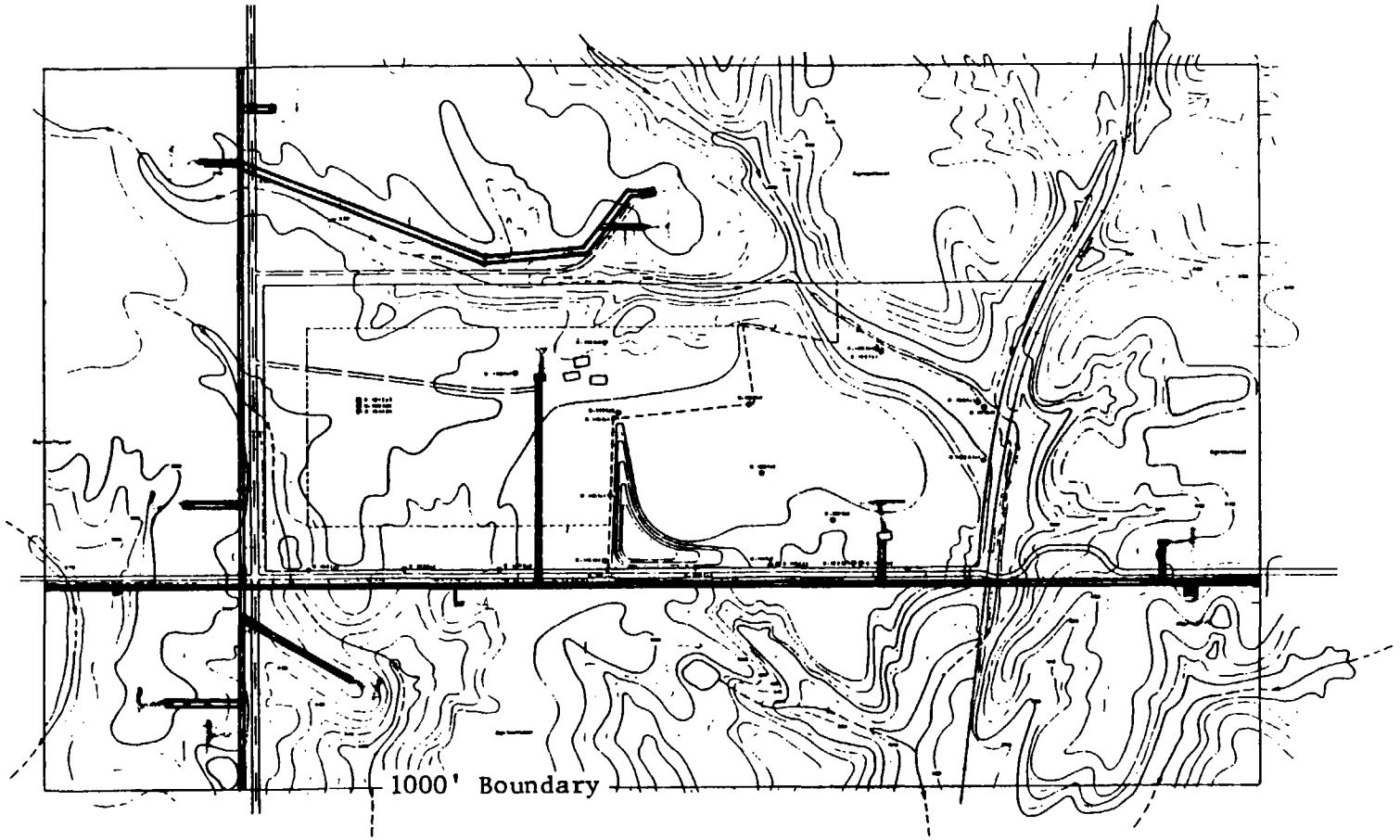
Photo # 6

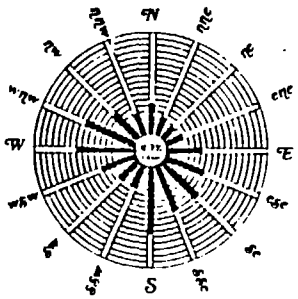
Photo # 7

Figure EA-2

BRIGHTON LANDFILL

Underground Conduit Locations





Scale: 1" = 850'

— Telephone Line

— Septic Line

— water Line